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(54) Title: NOVEL NUCLEIC ACIDS AND POLYPEPTIDES

(57) Abstract: The present invention provides novel nucleic acids, novel polypeptide sequences encoded by these nucleic acids and uses thereof.

NOVEL NUCLEIC ACIDS AND POLYPEPTIDES

1. TECHNICAL FIELD

The present invention provides novel polynucleotides and proteins encoded by
such polynucleotides, along with uses for these polynucleotides and proteins, for example
in therapeutic, diagnostic and research methods.

2. BACKGROUND

Technology aimed at the discovery of protein factors (including e.g., cytokines,
such as lymphokines, interferons, CSFs, chemokines, and interleukins) has matured
rapidly over the past decade. The now routine hybridization cloning and expression
cloning techniques clone novel polynucleotides "directly" in the sense that they rely on
information directly related to the discovered protein (i.e., partial DNA/amino acid
sequence of the protein in the case of hybridization cloning; activity of the protein in the
case of expression cloning). More recent "indirect" cloning techniques such as signal
sequence cloning, which isolates DNA sequences based on the presence of a now
well-recognized secretory leader sequence motif, as well as various PCR-based or low
stringency hybridization-based cloning techniques, have advanced the state of the art by
making available large numbers of DNA/amino acid sequences for proteins that are
known to have biological activity, for example, by virtue of their secreted nature in the
case of leader sequence cloning, by virtue of their cell or tissue source in the case of
PCR-based techniques, or by virtue of structural similarity to other genes of known
biological activity.

Identified polynucleotide and polypeptide sequences have numerous applications
in, for example, diagnostics, forensics, gene mapping; identification of mutations
responsible for genetic disorders or other traits, to assess biodiversity, and to produce
many other types of data and products dependent on DNA and amino acid sequences.

3. SUMMARY OF THE INVENTION

The compositions of the present invention include novel isolated polypeptides, novel
isolated polynucleotides encoding such polypeptides, including recombinant DNA

molecules, cloned genes or degenerate variants thereof, especially naturally occurring variants such as allelic variants, antisense polynucleotide molecules, and antibodies that specifically recognize one or more epitopes present on such polypeptides, as well as hybridomas producing such antibodies.

5   The compositions of the present invention additionally include vectors, including expression vectors, containing the polynucleotides of the invention, cells genetically engineered to contain such polynucleotides and cells genetically engineered to express such polynucleotides.

The present invention relates to a collection or library of at least one novel nucleic

10   acid sequence assembled from expressed sequence tags (ESTs) isolated mainly by sequencing by hybridization (SBH), and in some cases, sequences obtained from one or more public databases. The invention relates also to the proteins encoded by such polynucleotides, along with therapeutic, diagnostic and research utilities for these polynucleotides and proteins. These nucleic acid sequences are designated as SEQ ID NO:

15   1-739. The polypeptides sequences are designated SEQ ID NO: 740-1478. The nucleic acids and polypeptides are provided in the Sequence Listing. In the nucleic acids provided in the Sequence Listing, A is adenosine; C is cytosine; G is guanine; T is thymine; and N is any of the four bases. In the amino acids provided in the Sequence Listing, * corresponds to the stop codon.

20   The nucleic acid sequences of the present invention also include, nucleic acid sequences that hybridize to the complement of SEQ ID NO:1-739 under stringent hybridization conditions; nucleic acid sequences which are allelic variants or species homologues of any of the nucleic acid sequences recited above, or nucleic acid sequences that encode a peptide comprising a specific domain or truncation of the peptides encoded by

25   SEQ ID NO:1-739. A polynucleotide comprising a nucleotide sequence having at least 90% identity to an identifying sequence of SEQ ID NO:1-739 or a degenerate variant or fragment thereof. The identifying sequence can be 100 base pairs in length.

The nucleic acid sequences of the present invention also include the sequence information from the nucleic acid sequences of SEQ ID NO:1-739. The sequence

30   information can be a segment of any one of SEQ ID NO:1-739 that uniquely identifies or represents the sequence information of SEQ ID NO:1-739.

A collection as used in this application can be a collection of only one polynucleotide. The collection of sequence information or identifying information of each sequence can be provided on a nucleic acid array. In one embodiment, segments of sequence information is provided on a nucleic acid array to detect the polynucleotide that

5   contains the segment. The array can be designed to detect full-match or mismatch to the polynucleotide that contains the segment. The collection can also be provided in a computer-readable format.

This invention also includes the reverse or direct complement of any of the nucleic acid sequences recited above; cloning or expression vectors containing the nucleic acid

10   sequences; and host cells or organisms transformed with these expression vectors. Nucleic acid sequences (or their reverse or direct complements) according to the invention have numerous applications in a variety of techniques known to those skilled in the art of molecular biology, such as use as hybridization probes, use as primers for PCR, use in an array, use in computer-readable media, use in sequencing full-length genes, use for

15   chromosome and gene mapping, use in the recombinant production of protein, and use in the generation of anti-sense DNA or RNA, their chemical analogs and the like.

In a preferred embodiment, the nucleic acid sequences of SEQ ID NO:1-739 or novel segments or parts of the nucleic acids of the invention are used as primers in expression assays that are well known in the art. In a particularly preferred embodiment, the

20   nucleic acid sequences of SEQ ID NO:1-739 or novel segments or parts of the nucleic acids provided herein are used in diagnostics for identifying expressed genes or, as well known in the art and exemplified by Vollrath et al., Science 258:52-59 (1992), as expressed sequence tags for physical mapping of the human genome.

The isolated polynucleotides of the invention include, but are not limited to, a

25   polynucleotide comprising any one of the nucleotide sequences set forth in SEQ ID NO:1-739; a polynucleotide comprising any of the full length protein coding sequences of SEQ ID NO:1 - 739; and a polynucleotide comprising any of the nucleotide sequences of the mature protein coding sequences of SEQ ID NO: 1- 739. The polynucleotides of the present invention also include, but are not limited to, a polynucleotide that hybridizes under

30   stringent hybridization conditions to (a) the complement of any one of the nucleotide sequences set forth in SEQ ID NO:1-739; (b) a nucleotide sequence encoding any one of the

amino acid sequences set forth in the Sequence Listing; (c) a polynucleotide which is an

allelic variant of any polynucleotides recited above; (d) a polynucleotide which encodes a

species homolog (e.g. orthologs) of any of the proteins recited above; or (e) a

polynucleotide that encodes a polypeptide comprising a specific domain or truncation of any

5   of the polypeptides comprising an amino acid sequence set forth in the Sequence Listing.

The isolated polypeptides of the invention include, but are not limited to, a

polypeptide comprising any of the amino acid sequences set forth in the Sequence Listing;

or the corresponding full length or mature protein. Polypeptides of the invention also include

polypeptides with biological activity that are encoded by (a) any of the polynucleotides

10   having a nucleotide sequence set forth in SEQ ID NO:1-739; or (b) polynucleotides that

hybridize to the complement of the polynucleotides of (a) under stringent hybridization

conditions. Biologically or immunologically active variants of any of the polypeptide

sequences in the Sequence Listing, and "substantial equivalents" thereof (e.g., with at least

about 65%, 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% amino acid sequence identity)

15   that preferably retain biological activity are also contemplated. The polypeptides of the

invention may be wholly or partially chemically synthesized but are preferably produced by

recombinant means using the genetically engineered cells (e.g. host cells) of the invention.

The invention also provides compositions comprising a polypeptide of the

invention. Polypeptide compositions of the invention may further comprise an acceptable

20   carrier, such as a hydrophilic, e.g., pharmaceutically acceptable, carrier.

The invention also provides host cells transformed or transfected with a

polynucleotide of the invention.

The invention also relates to methods for producing a polypeptide of the invention

comprising growing a culture of the host cells of the invention in a suitable culture

25   medium under conditions permitting expression of the desired polypeptide, and purifying

the polypeptide from the culture or from the host cells. Preferred embodiments include

those in which the protein produced by such process is a mature form of the protein.

Polynucleotides according to the invention have numerous applications in a

variety of techniques known to those skilled in the art of molecular biology. These

30   techniques include use as hybridization probes, use as oligomers, or primers, for PCR,

use for chromosome and gene mapping, use in the recombinant production of protein,

and use in generation of anti-sense DNA or RNA, their chemical analogs and the like. For example, when the expression of an mRNA is largely restricted to a particular cell or tissue type, polynucleotides of the invention can be used as hybridization probes to detect the presence of the particular cell or tissue mRNA in a sample using, e.g., in situ

5   hybridization.

In other exemplary embodiments, the polynucleotides are used in diagnostics as expressed sequence tags for identifying expressed genes or, as well known in the art and exemplified by Vollrath et al., Science 258:52-59 (1992), as expressed sequence tags for physical mapping of the human genome.

10   The polypeptides according to the invention can be used in a variety of conventional procedures and methods that are currently applied to other proteins. For example, a polypeptide of the invention can be used to generate an antibody that specifically binds the polypeptide. Such antibodies, particularly monoclonal antibodies, are useful for detecting or quantitating the polypeptide in tissue. The polypeptides of the

15   invention can also be used as molecular weight markers, and as a food supplement.

Methods are also provided for preventing, treating, or ameliorating a medical condition which comprises the step of administering to a mammalian subject a therapeutically effective amount of a composition comprising a polypeptide of the present invention and a pharmaceutically acceptable carrier.

20   In particular, the polypeptides and polynucleotides of the invention can be utilized, for example, in methods for the prevention and/or treatment of disorders involving aberrant protein expression or biological activity.

The present invention further relates to methods for detecting the presence of the polynucleotides or polypeptides of the invention in a sample. Such methods can, for

25   example, be utilized as part of prognostic and diagnostic evaluation of disorders as recited herein and for the identification of subjects exhibiting a predisposition to such conditions. The invention provides a method for detecting the polynucleotides of the invention in a sample, comprising contacting the sample with a compound that binds to and forms a complex with the polynucleotide of interest for a period sufficient to form

30   the complex and under conditions sufficient to form a complex and detecting the complex such that if a complex is detected, the polynucleotide of interest is detected. The

invention also provides a method for detecting the polypeptides of the invention in a sample comprising contacting the sample with a compound that binds to and forms a complex with the polypeptide under conditions and for a period sufficient to form the complex and detecting the formation of the complex such that if a complex is formed, the

5   polypeptide is detected.

The invention also provides kits comprising polynucleotide probes and/or monoclonal antibodies, and optionally quantitative standards, for carrying out methods of the invention. Furthermore, the invention provides methods for evaluating the efficacy of drugs, and monitoring the progress of patients, involved in clinical trials for the treatment

10   of disorders as recited above.

The invention also provides methods for the identification of compounds that modulate (i.e., increase or decrease) the expression or activity of the polynucleotides and/or polypeptides of the invention. Such methods can be utilized, for example, for the identification of compounds that can ameliorate symptoms of disorders as recited herein.

15   Such methods can include, but are not limited to, assays for identifying compounds and other substances that interact with (e.g., bind to) the polypeptides of the invention. The invention provides a method for identifying a compound that binds to the polypeptides of the invention comprising contacting the compound with a polypeptide of the invention in a cell for a time sufficient to form a polypeptide/compound complex, wherein the

20   complex drives expression of a reporter gene sequence in the cell; and detecting the complex by detecting the reporter gene sequence expression such that if expression of the reporter gene is detected the compound the binds to a polypeptide of the invention is identified.

The methods of the invention also provides methods for treatment which involve

25   the administration of the polynucleotides or polypeptides of the invention to individuals exhibiting symptoms or tendencies. In addition, the invention encompasses methods for treating diseases or disorders as recited herein comprising administering compounds and other substances that modulate the overall activity of the target gene products. Compounds and other substances can effect such modulation either on the level of target

30   gene/protein expression or target protein activity.

The polypeptides of the present invention and the polynucleotides encoding them are also useful for the same functions known to one of skill in the art as the polypeptides and polynucleotides to which they have homology (set forth in Table 2). If no homology is set forth for a sequence, then the polypeptides and polynucleotides of the present

5   invention are useful for a variety of applications, as described herein, including use in arrays for detection.

4. DETAILED DESCRIPTION OF THE INVENTION

10

4.1 DEFINITIONS

It must be noted that as used herein and in the appended claims, the singular forms "a", "an" and "the" include plural references unless the context clearly dictates otherwise.

15   The term "active" refers to those forms of the polypeptide which retain the biologic and/or immunologic activities of any naturally occurring polypeptide. According to the invention, the terms "biologically active" or "biological activity" refer to a protein or peptide having structural, regulatory or biochemical functions of a naturally occurring molecule. Likewise "immunologically active" or "immunological activity" refers to the

20   capability of the natural, recombinant or synthetic polypeptide to induce a specific immune response in appropriate animals or cells and to bind with specific antibodies.

The term "activated cells" as used in this application are those cells which are engaged in extracellular or intracellular membrane trafficking, including the export of secretory or enzymatic molecules as part of a normal or disease process.

25   The terms "complementary" or "complementarity" refer to the natural binding of polynucleotides by base pairing. For example, the sequence 5'-AGT-3' binds to the complementary sequence 3'-TCA-5'. Complementarity between two single-stranded molecules may be "partial" such that only some of the nucleic acids bind or it may be "complete" such that total complementarity exists between the single stranded molecules.

30   The degree of complementarity between the nucleic acid strands has significant effects on the efficiency and strength of the hybridization between the nucleic acid strands.

The term "embryonic stem cells (ES)" refers to a cell that can give rise to many differentiated cell types in an embryo or an adult, including the germ cells. The term "germ line stem cells (GSCs)" refers to stem cells derived from primordial stem cells that provide a steady and continuous source of germ cells for the production of gametes. The term "primordial germ cells (PGCs)" refers to a small population of cells set aside from other cell lineages particularly from the yolk sac, mesenteries, or gonadal ridges during embryogenesis that have the potential to differentiate into germ cells and other cells. PGCs are the source from which GSCs and ES cells are derived The PGCs, the GSCs and the ES cells are capable of self-renewal. Thus these cells not only populate the germ line and give rise to a plurality of terminally differentiated cells that comprise the adult specialized organs, but are able to regenerate themselves.

The term "expression modulating fragment," EMF, means a series of nucleotides which modulates the expression of an operably linked ORF or another EMF.

As used herein, a sequence is said to "modulate the expression of an operably linked sequence" when the expression of the sequence is altered by the presence of the EMF. EMFs include, but are not limited to, promoters, and promoter modulating sequences (inducible elements). One class of EMFs are nucleic acid fragments which induce the expression of an operably linked ORF in response to a specific regulatory factor or physiological event.

The terms "nucleotide sequence" or "nucleic acid" or "polynucleotide" or "oligonculeotide" are used interchangeably and refer to a heteropolymer of nucleotides or the sequence of these nucleotides. These phrases also refer to DNA or RNA of genomic or synthetic origin which may be single-stranded or double-stranded and may represent the sense or the antisense strand, to peptide nucleic acid (PNA) or to any DNA-like or RNA-like material. In the sequences herein A is adenine, C is cytosine, T is thymine, G is guanine and N is A, C, G or T (U). It is contemplated that where the polynucleotide is RNA, the T (thymine) in the sequences provided herein is substituted with U (uracil). Generally, nucleic acid segments provided by this invention may be assembled from fragments of the genome and short oligonucleotide linkers, or from a series of oligonucleotides, or from individual nucleotides, to provide a synthetic nucleic acid

which is capable of being expressed in a recombinant transcriptional unit comprising regulatory elements derived from a microbial or viral operon, or a eukaryotic gene.

The terms "oligonucleotide fragment" or a "polynucleotide fragment", "portion," or "segment" or "probe" or "primer" are used interchangeably and refer to a sequence of

5   nucleotide residues which are at least about 5 nucleotides, more preferably at least about 7 nucleotides, more preferably at least about 9 nucleotides, more preferably at least about 11 nucleotides and most preferably at least about 17 nucleotides. The fragment is preferably less than about 500 nucleotides, preferably less than about 200 nucleotides, more preferably less than about 100 nucleotides, more preferably less than about 50

10   nucleotides and most preferably less than 30 nucleotides. Preferably the probe is from about 6 nucleotides to about 200 nucleotides, preferably from about 15 to about 50 nucleotides, more preferably from about 17 to 30 nucleotides and most preferably from about 20 to 25 nucleotides. Preferably the fragments can be used in polymerase chain reaction (PCR), various hybridization procedures or microarray procedures to identify or

15   amplify identical or related parts of mRNA or DNA molecules. A fragment or segment may uniquely identify each polynucleotide sequence of the present invention. Preferably the fragment comprises a sequence substantially similar to any one of SEQ ID NOs:1-20.

Probes may, for example, be used to determine whether specific mRNA molecules are present in a cell or tissue or to isolate similar nucleic acid sequences from

20   chromosomal DNA as described by Walsh et al. (Walsh, P.S. et al., 1992, PCR Methods Appl 1:241-250). They may be labeled by nick translation, Klenow fill-in reaction, PCR, or other methods well known in the art. Probes of the present invention, their preparation and/or labeling are elaborated in Sambrook, J. et al., 1989, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, NY; or Ausubel, F.M. et al., 1989,

25   Current Protocols in Molecular Biology, John Wiley & Sons, New York NY, both of which are incorporated herein by reference in their entirety.

The nucleic acid sequences of the present invention also include the sequence information from the nucleic acid sequences of SEQ ID NO:1-739. The sequence information can be a segment of any one of SEQ ID NO:1-739 that uniquely identifies or

30   represents the sequence information of that sequence of SEQ ID NO:1-739. One such segment can be a twenty-mer nucleic acid sequence because the probability that a twenty-

mer is fully matched in the human genome is 1 in 300. In the human genome, there are three billion base pairs in one set of chromosomes. Because 4^{20} possible twenty-mers exist, there are 300 times more twenty-mers than there are base pairs in a set of human chromosomes. Using the same analysis, the probability for a seventeen-mer to be fully matched in the human genome is approximately 1 in 5. When these segments are used in arrays for expression studies, fifteen-mer segments can be used. The probability that the fifteen-mer is fully matched in the expressed sequences is also approximately one in five because expressed sequences comprise less than approximately 5% of the entire genome sequence.

Similarly, when using sequence information for detecting a single mismatch, a segment can be a twenty-five mer. The probability that the twenty-five mer would appear in a human genome with a single mismatch is calculated by multiplying the probability for a full match $(1 \div 4^{25})$ times the increased probability for mismatch at each nucleotide position (3×25). The probability that an eighteen mer with a single mismatch can be detected in an array for expression studies is approximately one in five. The probability that a twenty-mer with a single mismatch can be detected in a human genome is approximately one in five.

The term "open reading frame," ORF, means a series of nucleotide triplets coding for amino acids without any termination codons and is a sequence translatable into protein.

The terms "operably linked" or "operably associated" refer to functionally related nucleic acid sequences. For example, a promoter is operably associated or operably linked with a coding sequence if the promoter controls the transcription of the coding sequence. While operably linked nucleic acid sequences can be contiguous and in the same reading frame, certain genetic elements e.g. repressor genes are not contiguously linked to the coding sequence but still control transcription/translation of the coding sequence.

The term "pluripotent" refers to the capability of a cell to differentiate into a number of differentiated cell types that are present in an adult organism. A pluripotent cell is restricted in its differentiation capability in comparison to a totipotent cell.

The terms "polypeptide" or "peptide" or "amino acid sequence" refer to an oligopeptide, peptide, polypeptide or protein sequence or fragment thereof and to

naturally occurring or synthetic molecules. A polypeptide "fragment," "portion," or "segment" is a stretch of amino acid residues of at least about 5 amino acids, preferably at least about 7 amino acids, more preferably at least about 9 amino acids and most preferably at least about 17 or more amino acids. The peptide preferably is not greater

5   than about 200 amino acids, more preferably less than 150 amino acids and most preferably less than 100 amino acids. Preferably the peptide is from about 5 to about 200 amino acids. To be active, any polypeptide must have sufficient length to display biological and/or immunological activity.

The term "naturally occurring polypeptide" refers to polypeptides produced by
10   cells that have not been genetically engineered and specifically contemplates various polypeptides arising from post-translational modifications of the polypeptide including, but not limited to, acetylation, carboxylation, glycosylation, phosphorylation, lipidation and acylation.

The term "translated protein coding portion" means a sequence which encodes for
15   the full length protein which may include any leader sequence or any processing sequence.

The term "mature protein coding sequence" means a sequence which encodes a peptide or protein without a signal or leader sequence. The "mature protein portion" means that portion of the protein which does not include a signal or leader sequence. The

20   peptide may have been produced by processing in the cell which removes any leader/signal sequence. The mature protein portion may or may not include the initial methionine residue. The methionine residue may be removed from the protein during processing in the cell. The peptide may be produced synthetically or the protein may have been produced using a polynucleotide only encoding for the mature protein coding

25   sequence.

The term "derivative" refers to polypeptides chemically modified by such techniques as ubiquitination, labeling (e.g., with radionuclides or various enzymes), covalent polymer attachment such as pegylation (derivatization with polyethylene glycol) and insertion or substitution by chemical synthesis of amino acids such as ornithine,

30   which do not normally occur in human proteins.

The term "variant"(or "analog") refers to any polypeptide differing from naturally occurring polypeptides by amino acid insertions, deletions, and substitutions, created using, *e g.*, recombinant DNA techniques. Guidance in determining which amino acid residues may be replaced, added or deleted without abolishing activities of interest, may

5   be found by comparing the sequence of the particular polypeptide with that of homologous peptides and minimizing the number of amino acid sequence changes made in regions of high homology (conserved regions) or by replacing amino acids with consensus sequence.

Alternatively, recombinant variants encoding these same or similar polypeptides

10 may be synthesized or selected by making use of the "redundancy" in the genetic code. Various codon substitutions, such as the silent changes which produce various restriction sites, may be introduced to optimize cloning into a plasmid or viral vector or expression in a particular prokaryotic or eukaryotic system. Mutations in the polynucleotide sequence may be reflected in the polypeptide or domains of other peptides added to the

15 polypeptide to modify the properties of any part of the polypeptide, to change characteristics such as ligand-binding affinities, interchain affinities, or degradation/turnover rate.

Preferably, amino acid "substitutions" are the result of replacing one amino acid with another amino acid having similar structural and/or chemical properties, *i.e.*,

20 conservative amino acid replacements. "Conservative" amino acid substitutions may be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity, and/or the amphipathic nature of the residues involved. For example, nonpolar (hydrophobic) amino acids include alanine, leucine, isoleucine, valine, proline, phenylalanine, tryptophan, and methionine; polar neutral amino acids include glycine,

25 serine, threonine, cysteine, tyrosine, asparagine, and glutamine; positively charged (basic) amino acids include arginine, lysine, and histidine; and negatively charged (acidic) amino acids include aspartic acid and glutamic acid. "Insertions" or "deletions" are preferably in the range of about 1 to 20 amino acids, more preferably 1 to 10 amino acids. The variation allowed may be experimentally determined by systematically making insertions,

30 deletions, or substitutions of amino acids in a polypeptide molecule using recombinant DNA techniques and assaying the resulting recombinant variants for activity.

Alternatively, where alteration of function is desired, insertions, deletions or non-conservative alterations can be engineered to produce altered polypeptides. Such alterations can, for example, alter one or more of the biological functions or biochemical characteristics of the polypeptides of the invention. For example, such alterations may

5   change polypeptide characteristics such as ligand-binding affinities, interchain affinities, or degradation/turnover rate. Further, such alterations can be selected so as to generate polypeptides that are better suited for expression, scale up and the like in the host cells chosen for expression. For example, cysteine residues can be deleted or substituted with another amino acid residue in order to eliminate disulfide bridges.

10   The terms "purified" or "substantially purified" as used herein denotes that the indicated nucleic acid or polypeptide is present in the substantial absence of other biological macromolecules, e.g., polynucleotides, proteins, and the like. In one embodiment, the polynucleotide or polypeptide is purified such that it constitutes at least 95% by weight, more preferably at least 99% by weight, of the indicated biological

15   macromolecules present (but water, buffers, and other small molecules, especially molecules having a molecular weight of less than 1000 daltons, can be present).

The term "isolated" as used herein refers to a nucleic acid or polypeptide separated from at least one other component (e.g., nucleic acid or polypeptide) present with the nucleic acid or polypeptide in its natural source. In one embodiment, the nucleic

20   acid or polypeptide is found in the presence of (if anything) only a solvent, buffer, ion, or other component normally present in a solution of the same. The terms "isolated" and "purified" do not encompass nucleic acids or polypeptides present in their natural source.

The term "recombinant," when used herein to refer to a polypeptide or protein, means that a polypeptide or protein is derived from recombinant (e.g., microbial, insect,

25   or mammalian) expression systems. "Microbial" refers to recombinant polypeptides or proteins made in bacterial or fungal (e.g., yeast) expression systems. As a product, "recombinant microbial" defines a polypeptide or protein essentially free of native endogenous substances and unaccompanied by associated native glycosylation. Polypeptides or proteins expressed in most bacterial cultures, e.g., E. coli, will be free of

30   glycosylation modifications; polypeptides or proteins expressed in yeast will have a glycosylation pattern in general different from those expressed in mammalian cells.

The term "recombinant expression vehicle or vector" refers to a plasmid or phage or virus or vector, for expressing a polypeptide from a DNA (RNA) sequence. An expression vehicle can comprise a transcriptional unit comprising an assembly of (1) a genetic element or elements having a regulatory role in gene expression, for example,

5   promoters or enhancers, (2) a structural or coding sequence which is transcribed into mRNA and translated into protein, and (3) appropriate transcription initiation and termination sequences. Structural units intended for use in yeast or eukaryotic expression systems preferably include a leader sequence enabling extracellular secretion of translated protein by a host cell. Alternatively, where recombinant protein is expressed

10   without a leader or transport sequence, it may include an amino terminal methionine residue. This residue may or may not be subsequently cleaved from the expressed recombinant protein to provide a final product.

The term "recombinant expression system" means host cells which have stably integrated a recombinant transcriptional unit into chromosomal DNA or carry the

15   recombinant transcriptional unit extrachromosomally. Recombinant expression systems as defined herein will express heterologous polypeptides or proteins upon induction of the regulatory elements linked to the DNA segment or synthetic gene to be expressed. This term also means host cells which have stably integrated a recombinant genetic element or elements having a regulatory role in gene expression, for example, promoters

20   or enhancers. Recombinant expression systems as defined herein will express polypeptides or proteins endogenous to the cell upon induction of the regulatory elements linked to the endogenous DNA segment or gene to be expressed. The cells can be prokaryotic or eukaryotic.

The term "secreted" includes a protein that is transported across or through a

25   membrane, including transport as a result of signal sequences in its amino acid sequence when it is expressed in a suitable host cell. "Secreted" proteins include without limitation proteins secreted wholly (e.g., soluble proteins) or partially (e.g., receptors) from the cell in which they are expressed. "Secreted" proteins also include without limitation proteins that are transported across the membrane of the endoplasmic reticulum. "Secreted"

30   proteins are also intended to include proteins containing non-typical signal sequences (e.g. Interleukin-1 Beta, see Krasney, P.A. and Young, P.R. (1992) Cytokine 4(2):134

-143) and factors released from damaged cells (e.g. Interleukin-1 Receptor Antagonist, see Arend, W.P. et. al. (1998) Annu. Rev. Immunol. 16:27-55)

Where desired, an expression vector may be designed to contain a "signal or leader sequence" which will direct the polypeptide through the membrane of a cell. Such a sequence may be naturally present on the polypeptides of the present invention or provided from heterologous protein sources by recombinant DNA techniques.

The term "stringent" is used to refer to conditions that are commonly understood in the art as stringent. Stringent conditions can include highly stringent conditions (i.e., hybridization to filter-bound DNA in 0.5 M $NaHPO_4$, 7% sodium dodecyl sulfate (SDS), 1 mM EDTA at 65°C, and washing in 0.1X SSC/0.1% SDS at 68°C), and moderately stringent conditions (i.e., washing in 0.2X SSC/0.1% SDS at 42°C). Other exemplary hybridization conditions are described herein in the examples.

In instances of hybridization of deoxyoligonucleotides, additional exemplary stringent hybridization conditions include washing in 6X SSC/0.05% sodium pyrophosphate at 37°C (for 14-base oligonucleotides), 48°C (for 17-base oligos), 55°C (for 20-base oligonucleotides), and 60°C (for 23-base oligonucleotides).

As used herein, "substantially equivalent" can refer both to nucleotide and amino acid sequences, for example a mutant sequence, that varies from a reference sequence by one or more substitutions, deletions, or additions, the net effect of which does not result in an adverse functional dissimilarity between the reference and subject sequences. Typically, such a substantially equivalent sequence varies from one of those listed herein by no more than about 35% (i.e., the number of individual residue substitutions, additions, and/or deletions in a substantially equivalent sequence, as compared to the corresponding reference sequence, divided by the total number of residues in the substantially equivalent sequence is about 0.35 or less). Such a sequence is said to have 65% sequence identity to the listed sequence. In one embodiment, a substantially equivalent, e.g., mutant, sequence of the invention varies from a listed sequence by no more than 30% (70% sequence identity); in a variation of this embodiment, by no more than 25% (75% sequence identity); and in a further variation of this embodiment, by no more than 20% (80% sequence identity) and in a further variation of this embodiment, by no more than 10% (90% sequence identity) and in a further variation of this embodiment,

by no more that 5% (95% sequence identity). Substantially equivalent, *e.g.*, mutant, amino acid sequences according to the invention preferably have at least 80% sequence identity with a listed amino acid sequence, more preferably at least 90% sequence identity. Substantially equivalent nucleotide sequences of the invention can have lower

5   percent sequence identities, taking into account, for example, the redundancy or degeneracy of the genetic code. Preferably, nucleotide sequence has at least about 65% identity, more preferably at least about 75% identity, and most preferably at least about 95% identity. For the purposes of the present invention, sequences having substantially equivalent biological activity and substantially equivalent expression characteristics are

10   considered substantially equivalent. For the purposes of determining equivalence, truncation of the mature sequence (*e.g.*, via a mutation which creates a spurious stop codon) should be disregarded. Sequence identity may be determined, e.g., using the Jotun Hein method (Hein, J. (1990) Methods Enzymol. 183:626-645). Identity between sequences can also be determined by other methods known in the art, e.g. by varying

15   hybridization conditions.

The term "totipotent" refers to the capability of a cell to differentiate into all of the cell types of an adult organism.

The term "transformation" means introducing DNA into a suitable host cell so that the DNA is replicable, either as an extrachromosomal element, or by chromosomal

20   integration. The term "transfection" refers to the taking up of an expression vector by a suitable host cell, whether or not any coding sequences are in fact expressed. The term "infection" refers to the introduction of nucleic acids into a suitable host cell by use of a virus or viral vector.

As used herein, an "uptake modulating fragment," UMF, means a series of

25   nucleotides which mediate the uptake of a linked DNA fragment into a cell. UMFs can be readily identified using known UMFs as a target sequence or target motif with the computer-based systems described below. The presence and activity of a UMF can be confirmed by attaching the suspected UMF to a marker sequence. The resulting nucleic acid molecule is then incubated with an appropriate host under appropriate conditions and

30   the uptake of the marker sequence is determined. As described above, a UMF will increase the frequency of uptake of a linked marker sequence.

Each of the above terms is meant to encompass all that is described for each, unless the context dictates otherwise.

4.2 NUCLEIC ACIDS OF THE INVENTION

5   Nucleotide sequences of the invention are set forth in the Sequence Listing.

The isolated polynucleotides of the invention include a polynucleotide comprising the nucleotide sequences of SEQ ID NO:1-739 ; a polynucleotide encoding any one of the peptide sequences of SEQ ID NO:740-1478; and a polynucleotide comprising the nucleotide sequence encoding the mature protein coding sequence of the polypeptides of

10   any one of SEQ ID NO:740-1478. The polynucleotides of the present invention also include, but are not limited to, a polynucleotide that hybridizes under stringent conditions to (a) the complement of any of the nucleotides sequences of SEQ ID NO:1-739 ; (b) nucleotide sequences encoding any one of the amino acid sequences set forth in the Sequence Listing; (c) a polynucleotide which is an allelic variant of any polynucleotide

15   recited above; (d) a polynucleotide which encodes a species homolog of any of the proteins recited above; or (e) a polynucleotide that encodes a polypeptide comprising a specific domain or truncation of the polypeptides of SEQ ID NO: 740-1478. Domains of interest may depend on the nature of the encoded polypeptide; e.g., domains in receptor-like polypeptides include ligand-binding, extracellular, transmembrane, or cytoplasmic

20   domains, or combinations thereof; domains in immunoglobulin-like proteins include the variable immunoglobulin-like domains; domains in enzyme-like polypeptides include catalytic and substrate binding domains; and domains in ligand polypeptides include receptor-binding domains.

The polynucleotides of the invention include naturally occurring or wholly or

25   partially synthetic DNA, e.g., cDNA and genomic DNA, and RNA, e.g., mRNA. The polynucleotides may include all of the coding region of the cDNA or may represent a portion of the coding region of the cDNA.

The present invention also provides genes corresponding to the cDNA sequences disclosed herein. The corresponding genes can be isolated in accordance with known

30   methods using the sequence information disclosed herein. Such methods include the preparation of probes or primers from the disclosed sequence information for identification

and/or amplification of genes in appropriate genomic libraries or other sources of genomic materials. Further 5' and 3' sequence can be obtained using methods known in the art. For example, full length cDNA or genomic DNA that corresponds to any of the polynucleotides of SEQ ID NO:1-739 can be obtained by screening appropriate cDNA or genomic DNA

5   libraries under suitable hybridization conditions using any of the polynucleotides of SEQ ID NO:1-739 or a portion thereof as a probe. Alternatively, the polynucleotides of SEQ ID NO:1-739 may be used as the basis for suitable primer(s) that allow identification and/or amplification of genes in appropriate genomic DNA or cDNA libraries.

The nucleic acid sequences of the invention can be assembled from ESTs and

10   sequences (including cDNA and genomic sequences) obtained from one or more public databases, such as dbEST, gbpri, and UniGene. The EST sequences can provide identifying sequence information, representative fragment or segment information, or novel segment information for the full-length gene.

The polynucleotides of the invention also provide polynucleotides including

15   nucleotide sequences that are substantially equivalent to the polynucleotides recited above. Polynucleotides according to the invention can have, e.g., at least about 65%, at least about 70%, at least about 75%, at least about 80%, more typically at least about 90%, and even more typically at least about 95%, sequence identity to a polynucleotide recited above.

20   Included within the scope of the nucleic acid sequences of the invention are nucleic acid sequence fragments that hybridize under stringent conditions to any of the nucleotide sequences of SEQ ID NO:1-739, or complements thereof, which fragment is greater than about 5 nucleotides, preferably 7 nucleotides, more preferably greater than 9 nucleotides and most preferably greater than 17 nucleotides. Fragments of, e.g. 15, 17, or

25   20 nucleotides or more that are selective for (i.e. specifically hybridize to any one of the polynucleotides of the invention) are contemplated. Probes capable of specifically hybridizing to a polynucleotide can differentiate polynucleotide sequences of the invention from other polynucleotide sequences in the same family of genes or can differentiate human genes from genes of other species, and are preferably based on

30   unique nucleotide sequences.

The sequences falling within the scope of the present invention are not limited to these specific sequences, but also include allelic and species variations thereof. Allelic and species variations can be routinely determined by comparing the sequence provided SEQ ID NO:1-739, a representative fragment thereof, or a nucleotide sequence at least 90%

5   identical, preferably 95% identical, to SEQ ID NO:1-739 with a sequence from another isolate of the same species. Furthermore, to accommodate codon variability, the invention includes nucleic acid molecules coding for the same amino acid sequences as do the specific ORFs disclosed herein. In other words, in the coding region of an ORF, substitution of one codon for another codon that encodes the same amino acid is expressly contemplated.

10   The nearest neighbor or homology result for the nucleic acids of the present invention, including SEQ ID NO:1-739, can be obtained by searching a database using an algorithm or a program. Preferably, a BLAST which stands for Basic Local Alignment Search Tool is used to search for local sequence alignments (Altshul, S.F. J Mol. Evol. 36 290-300 (1993) and Altschul S.F. et al. J. Mol. Biol. 21:403-410 (1990)). Alternatively a

15   FASTA version 3 search against Genpept, using Fastxy algorithm.

Species homologs (or orthologs) of the disclosed polynucleotides and proteins are also provided by the present invention. Species homologs may be isolated and identified by making suitable probes or primers from the sequences provided herein and screening a suitable nucleic acid source from the desired species.

20   The invention also encompasses allelic variants of the disclosed polynucleotides or proteins; that is, naturally-occurring alternative forms of the isolated polynucleotide which also encode proteins which are identical, homologous or related to that encoded by the polynucleotides.

The nucleic acid sequences of the invention are further directed to sequences

25   which encode variants of the described nucleic acids. These amino acid sequence variants may be prepared by methods known in the art by introducing appropriate nucleotide changes into a native or variant polynucleotide. There are two variables in the construction of amino acid sequence variants: the location of the mutation and the nature of the mutation. Nucleic acids encoding the amino acid sequence variants are preferably

30   constructed by mutating the polynucleotide to encode an amino acid sequence that does not occur in nature. These nucleic acid alterations can be made at sites that differ in the

nucleic acids from different species (variable positions) or in highly conserved regions (constant regions). Sites at such locations will typically be modified in series, *e.g.*, by substituting first with conservative choices (*e.g.*, hydrophobic amino acid to a different hydrophobic amino acid) and then with more distant choices (*e.g.*, hydrophobic amino

5   acid to a charged amino acid), and then deletions or insertions may be made at the target site. Amino acid sequence deletions generally range from about 1 to 30 residues, preferably about 1 to 10 residues, and are typically contiguous. Amino acid insertions include amino- and/or carboxyl-terminal fusions ranging in length from one to one hundred or more residues, as well as intrasequence insertions of single or multiple amino

10   acid residues. Intrasequence insertions may range generally from about 1 to 10 amino residues, preferably from 1 to 5 residues. Examples of terminal insertions include the heterologous signal sequences necessary for secretion or for intracellular targeting in different host cells and sequences such as FLAG or poly-histidine sequences useful for purifying the expressed protein.

15   In a preferred method, polynucleotides encoding the novel amino acid sequences are changed via site-directed mutagenesis. This method uses oligonucleotide sequences to alter a polynucleotide to encode the desired amino acid variant, as well as sufficient adjacent nucleotides on both sides of the changed amino acid to form a stable duplex on either side of the site of being changed. In general, the techniques of site-directed

20   mutagenesis are well known to those of skill in the art and this technique is exemplified by publications such as, Edelman et al., *DNA* 2:183 (1983). A versatile and efficient method for producing site-specific changes in a polynucleotide sequence was published by Zoller and Smith, *Nucleic Acids Res.* 10:6487-6500 (1982). PCR may also be used to create amino acid sequence variants of the novel nucleic acids. When small amounts of

25   template DNA are used as starting material, primer(s) that differs slightly in sequence from the corresponding region in the template DNA can generate the desired amino acid variant. PCR amplification results in a population of product DNA fragments that differ from the polynucleotide template encoding the polypeptide at the position specified by the primer. The product DNA fragments replace the corresponding region in the plasmid

30   and this gives a polynucleotide encoding the desired amino acid variant.

A further technique for generating amino acid variants is the cassette mutagenesis technique described in Wells et al., *Gene* 34:315 (1985); and other mutagenesis techniques well known in the art, such as, for example, the techniques in Sambrook et al., supra, and *Current Protocols in Molecular Biology*, Ausubel et al. Due to the inherent

5   degeneracy of the genetic code, other DNA sequences which encode substantially the same or a functionally equivalent amino acid sequence may be used in the practice of the invention for the cloning and expression of these novel nucleic acids. Such DNA sequences include those which are capable of hybridizing to the appropriate novel nucleic acid sequence under stringent conditions.

10 Polynucleotides encoding preferred polypeptide truncations of the invention can be used to generate polynucleotides encoding chimeric or fusion proteins comprising one or more domains of the invention and heterologous protein sequences.

The polynucleotides of the invention additionally include the complement of any of the polynucleotides recited above. The polynucleotide can be DNA (genomic, cDNA,

15. amplified, or synthetic) or RNA. Methods and algorithms for obtaining such polynucleotides are well known to those of skill in the art and can include, for example, methods for determining hybridization conditions that can routinely isolate polynucleotides of the desired sequence identities.

In accordance with the invention, polynucleotide sequences comprising the

20 mature protein coding sequences corresponding to any one of SEQ ID NO:1-739, or functional equivalents thereof, may be used to generate recombinant DNA molecules that direct the expression of that nucleic acid, or a functional equivalent thereof, in appropriate host cells. Also included are the cDNA inserts of any of the clones identified herein.

25 A polynucleotide according to the invention can be joined to any of a variety of other nucleotide sequences by well-established recombinant DNA techniques (see Sambrook J et al. (1989) Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, NY). Useful nucleotide sequences for joining to polynucleotides include an assortment of vectors, e.g., plasmids, cosmids, lambda phage derivatives, phagemids, and

30 the like, that are well known in the art. Accordingly, the invention also provides a vector including a polynucleotide of the invention and a host cell containing the polynucleotide.

In general, the vector contains an origin of replication functional in at least one organism, convenient restriction endonuclease sites, and a selectable marker for the host cell. Vectors according to the invention include expression vectors, replication vectors, probe generation vectors, and sequencing vectors. A host cell according to the invention can be

5   a prokaryotic or eukaryotic cell and can be a unicellular organism or part of a multicellular organism.

The present invention further provides recombinant constructs comprising a nucleic acid having any of the nucleotide sequences of SEQ ID NO:1-739 or a fragment thereof or any other polynucleotides of the invention. In one embodiment, the

10   recombinant constructs of the present invention comprise a vector, such as a plasmid or viral vector, into which a nucleic acid having any of the nucleotide sequences of SEQ ID NO:1-739 or a fragment thereof is inserted, in a forward or reverse orientation. In the case of a vector comprising one of the ORFs of the present invention, the vector may further comprise regulatory sequences, including for example, a promoter, operably

15   linked to the ORF. Large numbers of suitable vectors and promoters are known to those of skill in the art and are commercially available for generating the recombinant constructs of the present invention. The following vectors are provided by way of example. Bacterial: pBs, phagescript, PsiX174, pBluescript SK, pBs KS, pNH8a, pNH16a, pNH18a, pNH46a (Stratagene); pTrc99A, pKK223-3, pKK233-3, pDR540,

20   pRIT5 (Pharmacia). Eukaryotic: pWLneo, pSV2cat, pOG44, PXTI, pSG (Stratagene) pSVK3, pBPV, pMSG, pSVL (Pharmacia).

The isolated polynucleotide of the invention may be operably linked to an expression control sequence such as the pMT2 or pED expression vectors disclosed in Kaufman et al., *Nucleic Acids Res.* 19, 4485-4490 (1991), in order to produce the protein

25   recombinantly. Many suitable expression control sequences are known in the art. General methods of expressing recombinant proteins are also known and are exemplified in R. Kaufman, *Methods in Enzymology* 185, 537-566 (1990). As defined herein "operably linked" means that the isolated polynucleotide of the invention and an expression control sequence are situated within a vector or cell in such a way that the

30   protein is expressed by a host cell which has been transformed (transfected) with the ligated polynucleotide/expression control sequence.

Promoter regions can be selected from any desired gene using CAT
(chloramphenicol transferase) vectors or other vectors with selectable markers. Two
appropriate vectors are pKK232-8 and pCM7. Particular named bacterial promoters
include lacI, lacZ, T3, T7, gpt, lambda PR, and trc. Eukaryotic promoters include CMV

5   immediate early, HSV thymidine kinase, early and late SV40, LTRs from retrovirus, and
mouse metallothionein-I. Selection of the appropriate vector and promoter is well within
the level of ordinary skill in the art. Generally, recombinant expression vectors will
include origins of replication and selectable markers permitting transformation of the host
cell, e.g., the ampicillin resistance gene of *E. coli* and *S. cerevisiae* TRP1 gene, and a

10   promoter derived from a highly-expressed gene to direct transcription of a downstream
structural sequence. Such promoters can be derived from operons encoding glycolytic
enzymes such as 3-phosphoglycerate kinase (PGK), a-factor, acid phosphatase, or heat
shock proteins, among others. The heterologous structural sequence is assembled in
appropriate phase with translation initiation and termination sequences, and preferably, a

15   leader sequence capable of directing secretion of translated protein into the periplasmic
space or extracellular medium. Optionally, the heterologous sequence can encode a
fusion protein including an amino terminal identification peptide imparting desired
characteristics, e.g., stabilization or simplified purification of expressed recombinant
product. Useful expression vectors for bacterial use are constructed by inserting a

20   structural DNA sequence encoding a desired protein together with suitable translation
initiation and termination signals in operable reading phase with a functional promoter.
The vector will comprise one or more phenotypic selectable markers and an origin of
replication to ensure maintenance of the vector and to, if desirable, provide amplification
within the host. Suitable prokaryotic hosts for transformation include *E. coli, Bacillus*

25   *subtilis, Salmonella typhimurium* and various species within the genera *Pseudomonas,*
Streptomyces, and *Staphylococcus,* although others may also be employed as a matter of
choice.

As a representative but non-limiting example, useful expression vectors for
bacterial use can comprise a selectable marker and bacterial origin of replication derived

30   from commercially available plasmids comprising genetic elements of the well known
cloning vector pBR322 (ATCC 37017). Such commercial vectors include, for example,

pKK223-3 (Pharmacia Fine Chemicals, Uppsala, Sweden) and GEM 1 (Promega
Biotech, Madison, WI, USA). These pBR322 "backbone" sections are combined with an
appropriate promoter and the structural sequence to be expressed. Following
transformation of a suitable host strain and growth of the host strain to an appropriate cell
5   density, the selected promoter is induced or derepressed by appropriate means (e.g.,
temperature shift or chemical induction) and cells are cultured for an additional period.
Cells are typically harvested by centrifugation, disrupted by physical or chemical means,
and the resulting crude extract retained for further purification.

Polynucleotides of the invention can also be used to induce immune responses.
10   For example, as described in Fan et al., Nat. Biotech. 17:870-872 (1999), incorporated
herein by reference, nucleic acid sequences encoding a polypeptide may be used to
generate antibodies against the encoded polypeptide following topical administration of
naked plasmid DNA or following injection, and preferably intramuscular injection of the
DNA. The nucleic acid sequences are preferably inserted in a recombinant expression
15   vector and may be in the form of naked DNA.

4.3 ANTISENSE

Another aspect of the invention pertains to isolated antisense nucleic acid
molecules that are hybridizable to or complementary to the nucleic acid molecule
20   comprising the nucleotide sequence of SEQ ID NO:1-739, or fragments, analogs or
derivatives thereof. An "antisense" nucleic acid comprises a nucleotide sequence that is
complementary to a "sense" nucleic acid encoding a protein, e.g., complementary to the
coding strand of a double-stranded cDNA molecule or complementary to an mRNA
sequence. In specific aspects, antisense nucleic acid molecules are provided that
25   comprise a sequence complementary to at least about 10, 25, 50, 100, 250 or 500
nucleotides or an entire coding strand, or to only a portion thereof. Nucleic acid
molecules encoding fragments, homologs, derivatives and analogs of a protein of any of
SEQ ID NO:740-1478 or antisense nucleic acids complementary to a nucleic acid
sequence of SEQ ID NO:1-739 are additionally provided.
30   In one embodiment, an antisense nucleic acid molecule is antisense to a "coding
region" of the coding strand of a nucleotide sequence of the invention. The term "coding

region" refers to the region of the nucleotide sequence comprising codons which are translated into amino acid residues. In another embodiment, the antisense nucleic acid molecule is antisense to a "noncoding region" of the coding strand of a nucleotide sequence of the invention. The term "noncoding region" refers to 5' and 3' sequences

5   which flank the coding region that are not translated into amino acids (*i.e.*, also referred to as 5' and 3' untranslated regions).

Given the coding strand sequences encoding a nucleic acid disclosed herein (*e.g.*, SEQ ID NO:1-739 , antisense nucleic acids of the invention can be designed according to the rules of Watson and Crick or Hoogsteen base pairing. The antisense nucleic acid

10   molecule can be complementary to the entire coding region of a mRNA, but more preferably is an oligonucleotide that is antisense to only a portion of the coding or noncoding region of a mRNA. For example, the antisense oligonucleotide can be complementary to the region surrounding the translation start site of a mRNA. An antisense oligonucleotide can be, for example, about 5, 10, 15, 20, 25, 30, 35, 40, 45 or

15   50 nucleotides in length. An antisense nucleic acid of the invention can be constructed using chemical synthesis or enzymatic ligation reactions using procedures known in the art. For example, an antisense nucleic acid (*e.g.*, an antisense oligonucleotide) can be chemically synthesized using naturally occurring nucleotides or variously modified nucleotides designed to increase the biological stability of the molecules or to increase

20   the physical stability of the duplex formed between the antisense and sense nucleic acids, *e.g.*, phosphorothioate derivatives and acridine substituted nucleotides can be used.

Examples of modified nucleotides that can be used to generate the antisense nucleic acid include: 5-fluorouracil, 5-bromouracil, 5-chlorouracil, 5-iodouracil, hypoxanthine, xanthine, 4-acetylcytosine, 5-(carboxyhydroxylmethyl) uracil,

25   5-carboxymethylaminomethyl-2-thiouridine, 5-carboxymethylaminomethyluracil, dihydrouracil, beta-D-galactosylqueosine, inosine, N6-isopentenyladenine, 1-methylguanine, 1-methylinosine, 2,2-dimethylguanine, 2-methyladenine, 2-methylguanine, 3-methylcytosine, 5-methylcytosine, N6-adenine, 7-methylguanine, 5-methylaminomethyluracil, 5-methoxyaminomethyl-2-thiouracil,

30   beta-D-mannosylqueosine, 5'-methoxycarboxymethyluracil, 5-methoxyuracil, 2-methylthio-N6-isopentenyladenine, uracil-5-oxyacetic acid (v), wybutoxosine,

pseudouracil, queosine, 2-thiocytosine, 5-methyl-2-thiouracil, 2-thiouracil, 4-thiouracil,

5-methyluracil, uracil-5-oxyacetic acid methylester, uracil-5-oxyacetic acid (v),

5-methyl-2-thiouracil, 3-(3-amino-3-N-2-carboxypropyl) uracil, (acp3)w, and

2,6-diaminopurine. Alternatively, the antisense nucleic acid can be produced biologically

5   using an expression vector into which a nucleic acid has been subcloned in an antisense

orientation (i.e., RNA transcribed from the inserted nucleic acid will be of an antisense

orientation to a target nucleic acid of interest, described further in the following

subsection).

The antisense nucleic acid molecules of the invention are typically administered

10   to a subject or generated in situ such that they hybridize with or bind to cellular mRNA

and/or genomic DNA encoding a protein according to the invention to thereby inhibit

expression of the protein, e.g., by inhibiting transcription and/or translation. The

hybridization can be by conventional nucleotide complementarity to form a stable duplex,

or, for example, in the case of an antisense nucleic acid molecule that binds to DNA

15   duplexes, through specific interactions in the major groove of the double helix. An

example of a route of administration of antisense nucleic acid molecules of the invention

includes direct injection at a tissue site. Alternatively, antisense nucleic acid molecules

can be modified to target selected cells and then administered systemically. For example,

for systemic administration, antisense molecules can be modified such that they

20   specifically bind to receptors or antigens expressed on a selected cell surface, e.g., by

linking the antisense nucleic acid molecules to peptides or antibodies that bind to cell

surface receptors or antigens. The antisense nucleic acid molecules can also be delivered

to cells using the vectors described herein. To achieve sufficient intracellular

concentrations of antisense molecules, vector constructs in which the antisense nucleic

25   acid molecule is placed under the control of a strong pol II or pol III promoter are

preferred.

In yet another embodiment, the antisense nucleic acid molecule of the invention is

an α-anomeric nucleic acid molecule. An α-anomeric nucleic acid molecule forms

specific double-stranded hybrids with complementary RNA in which, contrary to the usual

30   β-units, the strands run parallel to each other (Gaultier et al. (1987) Nucleic Acids Res 15:

6625-6641). The antisense nucleic acid molecule can also comprise a

2'-o-methylribonucleotide (Inoue *et al.* (1987) *Nucleic Acids Res* 15: 6131-6148) or a chimeric RNA -DNA analogue (Inoue *et al.* (1987) *FEBS Lett* 215: 327-330).

4.4 RIBOZYMES AND PNA MOIETIES

5   In still another embodiment, an antisense nucleic acid of the invention is a ribozyme. Ribozymes are catalytic RNA molecules with ribonuclease activity that are capable of cleaving a single-stranded nucleic acid, such as a mRNA, to which they have a complementary region. Thus, ribozymes (*e.g.*, hammerhead ribozymes (described in Haselhoff and Gerlach (1988) *Nature* 334:585-591)) can be used to catalytically cleave a

10   mRNA transcripts to thereby inhibit translation of a mRNA. A ribozyme having specificity for a nucleic acid of the invention can be designed based upon the nucleotide sequence of a DNA disclosed herein (*i.e.*, SEQ ID NO:1-739). For example, a derivative of a Tetrahymena L-19 IVS RNA can be constructed in which the nucleotide sequence of the active site is complementary to the nucleotide sequence to be cleaved in a

15   SECX-encoding mRNA. See, *e.g.*, Cech *et al.* U.S. Pat. No. 4,987,071; and Cech *et al.* U.S. Pat. No. 5,116,742. Alternatively, SECX mRNA can be used to select a catalytic RNA having a specific ribonuclease activity from a pool of RNA molecules. See, *e.g.*, Bartel *et al.*, (1993) *Science* 261:1411-1418.

       Alternatively, gene expression can be inhibited by targeting nucleotide sequences

20   complementary to the regulatory region (*e.g.*, promoter and/or enhancers) to form triple helical structures that prevent transcription of the gene in target cells. See generally, Helene. (1991) *Anticancer Drug Des.* 6: 569-84; Helene. *et al.* (1992) *Ann. N.Y. Acad. Sci.* 660:27-36; and Maher (1992) *Bioassays* 14: 807-15.

       In various embodiments, the nucleic acids of the invention can be modified at the

25   base moiety, sugar moiety or phosphate backbone to improve, *e.g.*, the stability, hybridization, or solubility of the molecule. For example, the deoxyribose phosphate backbone of the nucleic acids can be modified to generate peptide nucleic acids (see Hyrup *et al.* (1996) *Bioorg Med Chem* 4: 5-23). As used herein, the terms "peptide nucleic acids" or "PNAs" refer to nucleic acid mimics, *e.g.*, DNA mimics, in which the

30   deoxyribose phosphate backbone is replaced by a pseudopeptide backbone and only the four natural nucleobases are retained. The neutral backbone of PNAs has been shown to

allow for specific hybridization to DNA and RNA under conditions of low ionic strength.
The synthesis of PNA oligomers can be performed using standard solid phase peptide
synthesis protocols as described in Hyrup *et al.* (1996) above; Perry-O'Keefe *et al.* (1996)
PNAS 93: 14670-675.

5   PNAs of the invention can be used in therapeutic and diagnostic applications. For
example, PNAs can be used as antisense or antigene agents for sequence-specific
modulation of gene expression by, *e.g.*, inducing transcription or translation arrest or
inhibiting replication. PNAs of the invention can also be used, *e.g.*, in the analysis of
single base pair mutations in a gene by, *e.g.*, PNA directed PCR clamping; as artificial

10   restriction enzymes when used in combination with other enzymes, *e.g.*, S1 nucleases
(Hyrup B. (1996) above); or as probes or primers for DNA sequence and hybridization
(Hyrup *et al.* (1996), above; Perry-O'Keefe (1996), above).

In another embodiment, PNAs of the invention can be modified, *e.g.*, to enhance
their stability or cellular uptake, by attaching lipophilic or other helper groups to PNA, by

15   the formation of PNA-DNA chimeras, or by the use of liposomes or other techniques of
drug delivery known in the art. For example, PNA-DNA chimeras can be generated that
may combine the advantageous properties of PNA and DNA. Such chimeras allow DNA
recognition enzymes, *e.g.*, RNase H and DNA polymerases, to interact with the DNA
portion while the PNA portion would provide high binding affinity and specificity.

20   PNA-DNA chimeras can be linked using linkers of appropriate lengths selected in terms
·of base stacking, number of bonds between the nucleobases, and orientation (Hyrup
(1996) above). The synthesis of PNA-DNA chimeras can be performed as described in
Hyrup (1996) above and Finn *et al.* (1996) *Nucl Acids Res* 24: 3357-63. For example, a
DNA chain can be synthesized on a solid support using standard phosphoramidite

25   coupling chemistry, and modified nucleoside analogs, *e.g.*,
5'-(4-methoxytrityl)amino-5'-deoxy-thymidine phosphoramidite, can be used between the
PNA and the 5' end of DNA (Mag *et al.* (1989) *Nucl Acid Res* 17: 5973-88). PNA
monomers are then coupled in a stepwise manner to produce a chimeric molecule with a
5' PNA segment and a 3' DNA segment (Finn *et al.* (1996) above). Alternatively,

30   chimeric molecules can be synthesized with a 5' DNA segment and a 3' PNA segment.
See, Petersen *et al.* (1975) *Bioorg Med Chem Lett* 5: 1119-11124.

In other embodiments, the oligonucleotide may include other appended groups such as peptides (*e.g.*, for targeting host cell receptors *in vivo*), or agents facilitating transport across the cell membrane (see, *e.g.*, Letsinger *et al.*, 1989, *Proc. Natl. Acad. Sci. U.S.A.* 86:6553-6556; Lemaitre *et al.*, 1987, Proc. *Natl. Acad. Sci.* 84:648-652; PCT

5   Publication No. WO88/09810) or the blood-brain barrier (see, *e.g.*, PCT Publication No. WO89/10134). In addition, oligonucleotides can be modified with hybridization triggered cleavage agents (See, *e.g.*, Krol *et al.*, 1988, *BioTechniques* 6:958-976) or intercalating agents. (See, *e.g.*, Zon, 1988, *Pharm. Res.* 5: 539-549). To this end, the oligonucleotide may be conjugated to another molecule, *e.g.*, a peptide, a hybridization triggered

10   cross-linking agent, a transport agent, a hybridization-triggered cleavage agent, etc.

4.5 HOSTS

The present invention further provides host cells genetically engineered to contain the polynucleotides of the invention. For example, such host cells may contain nucleic

15   acids of the invention introduced into the host cell using known transformation, transfection or infection methods. The present invention still further provides host cells genetically engineered to express the polynucleotides of the invention, wherein such polynucleotides are in operative association with a regulatory sequence heterologous to the host cell which drives expression of the polynucleotides in the cell.

20   Knowledge of nucleic acid sequences allows for modification of cells to permit, or increase, expression of endogenous polypeptide. Cells can be modified (e.g., by homologous recombination) to provide increased polypeptide expression by replacing, in whole or in part, the naturally occurring promoter with all or part of a heterologous promoter so that the cells express the polypeptide at higher levels. The heterologous

25   promoter is inserted in such a manner that it is operatively linked to the encoding sequences. See, for example, PCT International Publication No. WO94/12650, PCT International Publication No. WO92/20808, and PCT International Publication No. WO91/09955. It is also contemplated that, in addition to heterologous promoter DNA, amplifiable marker DNA (e.g., ada, dhfr, and the multifunctional CAD gene which

30   encodes carbamyl phosphate synthase, aspartate transcarbamylase, and dihydroorotase) and/or intron DNA may be inserted along with the heterologous promoter DNA. If

linked to the coding sequence, amplification of the marker DNA by standard selection methods results in co-amplification of the desired protein coding sequences in the cells.

The host cell can be a higher eukaryotic host cell, such as a mammalian cell, a lower eukaryotic host cell, such as a yeast cell, or the host cell can be a prokaryotic cell,

5   such as a bacterial cell. Introduction of the recombinant construct into the host cell can be effected by calcium phosphate transfection, DEAE, dextran mediated transfection, or electroporation (Davis, L. et al., *Basic Methods in Molecular Biology* (1986)). The host cells containing one of the polynucleotides of the invention, can be used in conventional manners to produce the gene product encoded by the isolated fragment (in the case of an

10 ORF) or can be used to produce a heterologous protein under the control of the EMF.

Any host/vector system can be used to express one or more of the ORFs of the present invention. These include, but are not limited to, eukaryotic hosts such as HeLa cells, Cv-1 cell, COS cells, 293 cells, and Sf9 cells, as well as prokaryotic host such as *E. coli* and *B. subtilis*. The most preferred cells are those which do not normally express the

15 particular polypeptide or protein or which expresses the polypeptide or protein at low natural level. Mature proteins can be expressed in mammalian cells, yeast, bacteria, or other cells under the control of appropriate promoters. Cell-free translation systems can also be employed to produce such proteins using RNAs derived from the DNA constructs of the present invention. Appropriate cloning and expression vectors for use with

20 prokaryotic and eukaryotic hosts are described by Sambrook, et al., in Molecular Cloning: A Laboratory Manual, Second Edition, Cold Spring Harbor, New York (1989), the disclosure of which is hereby incorporated by reference.

Various mammalian cell culture systems can also be employed to express recombinant protein. Examples of mammalian expression systems include the COS-7

25 lines of monkey kidney fibroblasts, described by Gluzman, Cell 23:175 (1981). Other cell lines capable of expressing a compatible vector are, for example, the C127, monkey COS cells, Chinese Hamster Ovary (CHO) cells, human kidney 293 cells, human epidermal A431 cells, human Colo205 cells, 3T3 cells, CV-1 cells, other transformed primate cell lines, normal diploid cells, cell strains derived from *in vitro* culture of

30 primary tissue, primary explants, HeLa cells, mouse L cells, BHK, HL-60, U937, HaK or Jurkat cells. Mammalian expression vectors will comprise an origin of replication, a

suitable promoter and also any necessary ribosome binding sites, polyadenylation site, splice donor and acceptor sites, transcriptional termination sequences, and 5′ flanking nontranscribed sequences. DNA sequences derived from the SV40 viral genome, for example, SV40 origin, early promoter, enhancer, splice, and polyadenylation sites may be used to provide the required nontranscribed genetic elements. Recombinant polypeptides and proteins produced in bacterial culture are usually isolated by initial extraction from cell pellets, followed by one or more salting-out, aqueous ion exchange or size exclusion chromatography steps. Protein refolding steps can be used, as necessary, in completing configuration of the mature protein. Finally, high performance liquid chromatography (HPLC) can be employed for final purification steps. Microbial cells employed in expression of proteins can be disrupted by any convenient method, including freeze-thaw cycling, sonication, mechanical disruption, or use of cell lysing agents.

Alternatively, it may be possible to produce the protein in lower eukaryotes such as yeast or insects or in prokaryotes such as bacteria. Potentially suitable yeast strains include *Saccharomyces cerevisiae, Schizosaccharomyces pombe, Kluyveromyces* strains, *Candida*, or any yeast strain capable of expressing heterologous proteins. Potentially suitable bacterial strains include *Escherichia coli, Bacillus subtilis, Salmonella typhimurium*, or any bacterial strain capable of expressing heterologous proteins. If the protein is made in yeast or bacteria, it may be necessary to modify the protein produced therein, for example by phosphorylation or glycosylation of the appropriate sites, in order to obtain the functional protein. Such covalent attachments may be accomplished using known chemical or enzymatic methods.

In another embodiment of the present invention, cells and tissues may be engineered to express an endogenous gene comprising the polynucleotides of the invention under the control of inducible regulatory elements, in which case the regulatory sequences of the endogenous gene may be replaced by homologous recombination. As described herein, gene targeting can be used to replace a gene's existing regulatory region with a regulatory sequence isolated from a different gene or a novel regulatory sequence synthesized by genetic engineering methods. Such regulatory sequences may be comprised of promoters, enhancers, scaffold-attachment regions, negative regulatory elements, transcriptional initiation sites, regulatory protein binding sites or combinations

of said sequences. Alternatively, sequences which affect the structure or stability of the RNA or protein produced may be replaced, removed, added, or otherwise modified by targeting. These sequence include polyadenylation signals, mRNA stability elements, splice sites, leader sequences for enhancing or modifying transport or secretion properties

5   of the protein, or other sequences which alter or improve the function or stability of protein or RNA molecules.

The targeting event may be a simple insertion of the regulatory sequence, placing the gene under the control of the new regulatory sequence, *e.g.*, inserting a new promoter or enhancer or both upstream of a gene. Alternatively, the targeting event may be a

10   simple deletion of a regulatory element, such as the deletion of a tissue-specific negative regulatory element. Alternatively, the targeting event may replace an existing element; for example, a tissue-specific enhancer can be replaced by an enhancer that has broader or different cell-type specificity than the naturally occurring elements. Here, the naturally occurring sequences are deleted and new sequences are added. In all cases, the

15   identification of the targeting event may be facilitated by the use of one or more selectable marker genes that are contiguous with the targeting DNA, allowing for the selection of cells in which the exogenous DNA has integrated into the host cell genome. The identification of the targeting event may also be facilitated by the use of one or more marker genes exhibiting the property of negative selection, such that the negatively

20   selectable marker is linked to the exogenous DNA, but configured such that the negatively selectable marker flanks the targeting sequence, and such that a correct homologous recombination event with sequences in the host cell genome does not result in the stable integration of the negatively selectable marker. Markers useful for this purpose include the Herpes Simplex Virus thymidine kinase (TK) gene or the bacterial

25   xanthine-guanine phosphoribosyl-transferase (gpt) gene.

The gene targeting or gene activation techniques which can be used in accordance with this aspect of the invention are more particularly described in U.S. Patent No. 5,272,071 to Chappel; U.S. Patent No. 5,578,461 to Sherwin et al.; International Application No. PCT/US92/09627 (WO93/09222) by Selden et al.; and International

30   Application No. PCT/US90/06436 (WO91/06667) by Skoultchi et al., each of which is incorporated by reference herein in its entirety.

4.6 POLYPEPTIDES OF THE INVENTION

The isolated polypeptides of the invention include, but are not limited to, a polypeptide comprising: the amino acid sequences set forth as any one of SEQ ID

5   NO:740-1478 or an amino acid sequence encoded by any one of the nucleotide sequences SEQ ID NO:1-739 or the corresponding full length or mature protein. Polypeptides of the invention also include polypeptides preferably with biological or immunological activity that are encoded by: (a) a polynucleotide having any one of the nucleotide sequences set forth in SEQ ID NO:1-739 or (b) polynucleotides encoding any one of the amino acid

10   sequences set forth as SEQ ID NO:740-1478 or (c) polynucleotides that hybridize to the complement of the polynucleotides of either (a) or (b) under stringent hybridization conditions. The invention also provides biologically active or immunologically active variants of any of the amino acid sequences set forth as SEQ ID NO:740-1478 or the corresponding full length or mature protein; and "substantial equivalents" thereof (e.g.,

15   with at least about 65%, at least about 70%, at least about 75%, at least about 80%, at least about 85%, at least about 90%, typically at least about 95%, more typically at least about 98%, or most typically at least about 99% amino acid identity) that retain biological activity. Polypeptides encoded by allelic variants may have a similar, increased, or decreased activity compared to polypeptides comprising SEQ ID NO:740-

20   1478.

Fragments of the proteins of the present invention which are capable of exhibiting biological activity are also encompassed by the present invention. Fragments of the protein may be in linear form or they may be cyclized using known methods, for example, as described in H. U. Saragovi, et al., Bio/Technology 10, 773-778 (1992) and

25   in R. S. McDowell, et al., J. Amer. Chem. Soc. 114, 9245-9253 (1992), both of which are incorporated herein by reference. Such fragments may be fused to carrier molecules such as immunoglobulins for many purposes, including increasing the valency of protein binding sites.

The present invention also provides both full-length and mature forms (for

30   example, without a signal sequence or precursor sequence) of the disclosed proteins. The protein coding sequence is identified in the sequence listing by translation of the

disclosed nucleotide sequences. The mature form of such protein may be obtained by expression of a full-length polynucleotide in a suitable mammalian cell or other host cell. The sequence of the mature form of the protein is also determinable from the amino acid sequence of the full-length form. Where proteins of the present invention are membrane

5 bound, soluble forms of the proteins are also provided. In such forms, part or all of the regions causing the proteins to be membrane bound are deleted so that the proteins are fully secreted from the cell in which they are expressed.

Protein compositions of the present invention may further comprise an acceptable carrier, such as a hydrophilic, *e.g.*, pharmaceutically acceptable, carrier.

10 The present invention further provides isolated polypeptides encoded by the nucleic acid fragments of the present invention or by degenerate variants of the nucleic acid fragments of the present invention. By "degenerate variant" is intended nucleotide fragments which differ from a nucleic acid fragment of the present invention (*e.g.*, an ORF) by nucleotide sequence but, due to the degeneracy of the genetic code, encode an

15 identical polypeptide sequence. Preferred nucleic acid fragments of the present invention are the ORFs that encode proteins.

A variety of methodologies known in the art can be utilized to obtain any one of the isolated polypeptides or proteins of the present invention. At the simplest level, the amino acid sequence can be synthesized using commercially available peptide

20 synthesizers. The synthetically-constructed protein sequences, by virtue of sharing primary, secondary or tertiary structural and/or conformational characteristics with proteins may possess biological properties in common therewith, including protein activity. This technique is particularly useful in producing small peptides and fragments of larger polypeptides. Fragments are useful, for example, in generating antibodies

25 against the native polypeptide. Thus, they may be employed as biologically active or immunological substitutes for natural, purified proteins in screening of therapeutic compounds and in immunological processes for the development of antibodies.

The polypeptides and proteins of the present invention can alternatively be purified from cells which have been altered to express the desired polypeptide or protein.

30 As used herein, a cell is said to be altered to express a desired polypeptide or protein when the cell, through genetic manipulation, is made to produce a polypeptide or protein

which it normally does not produce or which the cell normally produces at a lower level. One skilled in the art can readily adapt procedures for introducing and expressing either recombinant or synthetic sequences into eukaryotic or prokaryotic cells in order to generate a cell which produces one of the polypeptides or proteins of the present

5   invention.

The invention also relates to methods for producing a polypeptide comprising growing a culture of host cells of the invention in a suitable culture medium, and purifying the protein from the cells or the culture in which the cells are grown. For example, the methods of the invention include a process for producing a polypeptide in

10   which a host cell containing a suitable expression vector that includes a polynucleotide of the invention is cultured under conditions that allow expression of the encoded polypeptide. The polypeptide can be recovered from the culture, conveniently from the culture medium, or from a lysate prepared from the host cells and further purified. Preferred embodiments include those in which the protein produced by such process is a

15   full length or mature form of the protein.

In an alternative method, the polypeptide or protein is purified from bacterial cells which naturally produce the polypeptide or protein. One skilled in the art can readily follow known methods for isolating polypeptides and proteins in order to obtain one of the isolated polypeptides or proteins of the present invention. These include, but

20   are not limited to, immunochromatography, HPLC, size-exclusion chromatography, ion-exchange chromatography, and immuno-affinity chromatography. See, *e.g.*, Scopes, *Protein Purification: Principles and Practice*, Springer-Verlag (1994); Sambrook, et al., in Molecular Cloning: *A Laboratory Manual*; Ausubel et al., *Current Protocols in Molecular Biology*. Polypeptide fragments that retain biological/immunological activity

25   include fragments comprising greater than about 100 amino acids, or greater than about 200 amino acids, and fragments that encode specific protein domains.

The purified polypeptides can be used in *in vitro* binding assays which are well known in the art to identify molecules which bind to the polypeptides. These molecules include but are not limited to, for e.g., small molecules, molecules from combinatorial

30   libraries, antibodies or other proteins. The molecules identified in the binding assay are then tested for antagonist or agonist activity in *in vivo* tissue culture or animal models

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that are well known in the art. In brief, the molecules are titrated into a plurality of cell cultures or animals and then tested for either cell/animal death or prolonged survival of the animal/cells.

In addition, the peptides of the invention or molecules capable of binding to the

5   peptides may be complexed with toxins, e.g., ricin or cholera, or with other compounds that are toxic to cells. The toxin-binding molecule complex is then targeted to a tumor or other cell by the specificity of the binding molecule for SEQ ID NO:740-1478.

The protein of the invention may also be expressed as a product of transgenic animals, e.g., as a component of the milk of transgenic cows, goats, pigs, or sheep which

10   are characterized by somatic or germ cells containing a nucleotide sequence encoding the protein.

The proteins provided herein also include proteins characterized by amino acid sequences similar to those of purified proteins but into which modification are naturally provided or deliberately engineered. For example, modifications, in the peptide or DNA

15   sequence, can be made by those skilled in the art using known techniques. Modifications of interest in the protein sequences may include the alteration, substitution, replacement, insertion or deletion of a selected amino acid residue in the coding sequence. For example, one or more of the cysteine residues may be deleted or replaced with another amino acid to alter the conformation of the molecule. Techniques for such alteration,

20   substitution, replacement, insertion or deletion are well known to those skilled in the art (see, e.g., U.S. Pat. No. 4,518,584). Preferably, such alteration, substitution, replacement, insertion or deletion retains the desired activity of the protein. Regions of the protein that are important for the protein function can be determined by various methods known in the art including the alanine-scanning method which involved systematic substitution of

25   single or strings of amino acids with alanine, followed by testing the resulting alanine-containing variant for biological activity. This type of analysis determines the importance of the substituted amino acid(s) in biological activity. Regions of the protein that are important for protein function may be determined by the eMATRIX program.

Other fragments and derivatives of the sequences of proteins which would be

30   expected to retain protein activity in whole or in part and are useful for screening or other

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immunological methodologies may also be easily made by those skilled in the art given the disclosures herein. Such modifications are encompassed by the present invention.

The protein may also be produced by operably linking the isolated polynucleotide of the invention to suitable control sequences in one or more insect expression vectors,

5   and employing an insect expression system. Materials and methods for baculovirus/insect cell expression systems are commercially available in kit form from, e.g., Invitrogen, San Diego, Calif., U.S.A. (the MaxBat™ kit), and such methods are well known in the art, as described in Summers and Smith, Texas Agricultural Experiment Station Bulletin No. 1555 (1987), incorporated herein by reference. As used herein, an

10   insect cell capable of expressing a polynucleotide of the present invention is "transformed."

The protein of the invention may be prepared by culturing transformed host cells under culture conditions suitable to express the recombinant protein. The resulting expressed protein may then be purified from such culture (i.e., from culture medium or

15   cell extracts) using known purification processes, such as gel filtration and ion exchange chromatography. The purification of the protein may also include an affinity column containing agents which will bind to the protein; one or more column steps over such affinity resins as concanavalin A-agarose, heparin-toyopearl™ or Cibacrom blue 3GA Sepharose™; one or more steps involving hydrophobic interaction chromatography using

20   such resins as phenyl ether, butyl ether, or propyl ether; or immunoaffinity chromatography.

Alternatively, the protein of the invention may also be expressed in a form which will facilitate purification. For example, it may be expressed as a fusion protein, such as those of maltose binding protein (MBP), glutathione-S-transferase (GST) or thioredoxin

25   (TRX), or as a His tag. Kits for expression and purification of such fusion proteins are commercially available from New England BioLab (Beverly, Mass.), Pharmacia (Piscataway, N.J.) and Invitrogen, respectively. The protein can also be tagged with an epitope and subsequently purified by using a specific antibody directed to such epitope. One such epitope ("FLAG®") is commercially available from Kodak (New Haven,

30   Conn.).

Finally, one or more reverse-phase high performance liquid chromatography (RP-
HPLC) steps employing hydrophobic RP-HPLC media, *e.g.*, silica gel having pendant
methyl or other aliphatic groups, can be employed to further purify the protein. Some or
all of the foregoing purification steps, in various combinations, can also be employed to

5   provide a substantially homogeneous isolated recombinant protein. The protein thus
purified is substantially free of other mammalian proteins and is defined in accordance
with the present invention as an "isolated protein."

The polypeptides of the invention include analogs (variants). This embraces
fragments, as well as peptides in which one or more amino acids has been deleted,

10   inserted, or substituted. Also, analogs of the polypeptides of the invention embrace
fusions of the polypeptides or modifications of the polypeptides of the invention, wherein
the polypeptide or analog is fused to another moiety or moieties, e.g., targeting moiety or
another therapeutic agent. Such analogs may exhibit improved properties such as activity
and/or stability. Examples of moieties which may be fused to the polypeptide or an

15   analog include, for example, targeting moieties which provide for the delivery of
polypeptide to pancreatic cells, e.g., antibodies to pancreatic cells, antibodies to immune
cells such as T-cells, monocytes, dendritic cells, granulocytes, etc., as well as receptor
and ligands expressed on pancreatic or immune cells. Other moieties which may be
fused to the polypeptide include therapeutic agents which are used for treatment, for

20   example, immunosuppressive drugs such as cyclosporin, SK506, azathioprine, CD3
antibodies and steroids. Also, polypeptides may be fused to immune modulators, and
other cytokines such as alpha or beta interferon.

4.6.1 DETERMINING POLYPEPTIDE AND POLYNUCLEOTIDE
25   IDENTITY AND SIMILARITY

Preferred identity and/or similarity are designed to give the largest match
between the sequences tested. Methods to determine identity and similarity are codified
in computer programs including, but are not limited to, the GCG program package,
including GAP (Devereux, J., et al., Nucleic Acids Research 12(1):387 (1984); Genetics

30   Computer Group, University of Wisconsin, Madison, WI), BLASTP, BLASTN,
BLASTX, FASTA (Altschul, S.F. et al., J. Molec. Biol. 215:403-410 (1990), PSI-BLAST

(Altschul S.F. et al., Nucleic Acids Res. vol. 25, pp. 3389-3402, herein incorporated by

reference), eMatrix software (Wu et al., J. Comp. Biol., Vol. 6, pp. 219-235 (1999),

herein incorporated by reference), eMotif software (Nevill-Manning et al, ISMB-97, Vol.

4, pp. 202-209, herein incorporated by reference), pFam software (Sonnhammer et al.,

5   Nucleic Acids Res., Vol. 26(1), pp. 320-322 (1998), herein incorporated by reference)

and the Kyte-Doolittle hydrophobocity prediction algorithm (J. Mol Biol, 157, pp. 105-31

(1982), incorporated herein by reference). The BLAST programs are publicly available

from the National Center for Biotechnology Information (NCBI) and other sources

(BLAST Manual, Altschul, S., et al. NCB NLM NIH Bethesda, MD 20894; Altschul, S.,

10   et al., J. Mol. Biol. 215:403-410 (1990).

4.7 CHIMERIC AND FUSION PROTEINS

        The invention also provides chimeric or fusion proteins. As used herein, a

"chimeric protein" or "fusion protein" comprises a polypeptide of the invention

operatively linked to another polypeptide. Within a fusion protein the polypeptide

15   according to the invention can correspond to all or a portion of a protein according to the

invention. In one embodiment, a fusion protein comprises at least one biologically active

portion of a protein according to the invention. In another embodiment, a fusion protein

comprises at least two biologically active portions of a protein according to the

invention. Within the fusion protein, the term "operatively linked" is intended to indicate

20   that the polypeptide according to the invention and the other polypeptide are fused

in-frame to each other. The polypeptide can be fused to the N-terminus or C-terminus.

        For example, in one embodiment a fusion protein comprises a polypeptide

according to the invention operably linked to the extracellular domain of a second

protein.

25   In another embodiment, the fusion protein is a GST-fusion protein in which the

polypeptide sequences of the invention are fused to the C-terminus of the GST (i.e.,

glutathione S-transferase) sequences.

        In another embodiment, the fusion protein is an immunoglobulin fusion protein in

which the polypeptide sequences according to the invention comprises one or more

30   domains are fused to sequences derived from a member of the immunoglobulin protein

family. The immunoglobulin fusion proteins of the invention can be incorporated into

pharmaceutical compositions and administered to a subject to inhibit an interaction between a ligand and a protein of the invention on the surface of a cell, to thereby suppress signal transduction *in vivo*. The immunoglobulin fusion proteins can be used to affect the bioavailability of a cognate ligand. Inhibition of the ligand/protein interaction

5   may be useful therapeutically for both the treatment of proliferative and differentiative disorders, *e,g.,* cancer as well as modulating (*e.g.,* promoting or inhibiting) cell survival. Moreover, the immunoglobulin fusion proteins of the invention can be used as immunogens to produce antibodies in a subject, to purify ligands, and in screening assays to identify molecules that inhibit the interaction of a polypeptide of the invention with a

10   ligand.

A chimeric or fusion protein of the invention can be produced by standard recombinant DNA techniques. For example, DNA fragments coding for the different polypeptide sequences are ligated together in-frame in accordance with conventional techniques, *e.g.,* by employing blunt-ended or stagger-ended termini for ligation,

15   restriction enzyme digestion to provide for appropriate termini, filling-in of cohesive ends as appropriate, alkaline phosphatase treatment to avoid undesirable joining, and enzymatic ligation. In another embodiment, the fusion gene can be synthesized by conventional techniques including automated DNA synthesizers. Alternatively, PCR amplification of gene fragments can be carried out using anchor primers that give rise to

20   complementary overhangs between two consecutive gene fragments that can subsequently be annealed and reamplified to generate a chimeric gene sequence (see, for example, Ausubel et al. (eds.) CURRENT PROTOCOLS IN MOLECULAR BIOLOGY, John Wiley & Sons, 1992). Moreover, many expression vectors are commercially available that already encode a fusion moiety (*e.g.,* a GST polypeptide). A nucleic acid encoding

25   a polypeptide of the invention can be cloned into such an expression vector such that the fusion moiety is linked in-frame to the protein of the invention.

4.8 GENE THERAPY

Mutations in the polynucleotides of the invention gene may result in loss of
30   normal function of the encoded protein. The invention thus provides gene therapy to restore normal activity of the polypeptides of the invention; or to treat disease states

involving polypeptides of the invention. Delivery of a functional gene encoding polypeptides of the invention to appropriate cells is effected *ex vivo*, *in situ*, or *in vivo* by use of vectors, and more particularly viral vectors (e.g., adenovirus, adeno-associated virus, or a retrovirus), or *ex vivo* by use of physical DNA transfer methods (e.g.,

5   liposomes or chemical treatments). See, for example, Anderson, Nature, supplement to vol. 392, no. 6679, pp.25-20 (1998). For additional reviews of gene therapy technology see Friedmann, Science, 244: 1275-1281 (1989); Verma, Scientific American: 68-84 (1990); and Miller, Nature, 357: 455-460 (1992). Introduction of any one of the nucleotides of the present invention or a gene encoding the polypeptides of the present

10   invention can also be accomplished with extrachromosomal substrates (transient expression) or artificial chromosomes (stable expression). Cells may also be cultured *ex vivo* in the presence of proteins of the present invention in order to proliferate or to produce a desired effect on or activity in such cells. Treated cells can then be introduced *in vivo* for therapeutic purposes. Alternatively, it is contemplated that in other human

15   disease states, preventing the expression of or inhibiting the activity of polypeptides of the invention will be useful in treating the disease states. It is contemplated that antisense therapy or gene therapy could be applied to negatively regulate the expression of polypeptides of the invention.

Other methods inhibiting expression of a protein include the introduction of

20   antisense molecules to the nucleic acids of the present invention, their complements, or their translated RNA sequences, by methods known in the art. Further, the polypeptides of the present invention can be inhibited by using targeted deletion methods, or the insertion of a negative regulatory element such as a silencer, which is tissue specific.

The present invention still further provides cells genetically engineered *in vivo* to

25   express the polynucleotides of the invention, wherein such polynucleotides are in operative association with a regulatory sequence heterologous to the host cell which drives expression of the polynucleotides in the cell. These methods can be used to increase or decrease the expression of the polynucleotides of the present invention.

Knowledge of DNA sequences provided by the invention allows for modification of

30   cells to permit, increase, or decrease, expression of endogenous polypeptide. Cells can be modified (e.g., by homologous recombination) to provide increased polypeptide expression

by replacing, in whole or in part, the naturally occurring promoter with all or part of a heterologous promoter so that the cells express the protein at higher levels. The heterologous promoter is inserted in such a manner that it is operatively linked to the desired protein encoding sequences. See, for example, PCT International Publication No. WO 94/12650,

5   PCT International Publication No. WO 92/20808, and PCT International Publication No. WO 91/09955. It is also contemplated that, in addition to heterologous promoter DNA, amplifiable marker DNA (e.g., ada, dhfr, and the multifunctional CAD gene which encodes carbamyl phosphate synthase, aspartate transcarbamylase, and dihydroorotase) and/or intron DNA may be inserted along with the heterologous promoter DNA. If linked to the desired

10   protein coding sequence, amplification of the marker DNA by standard selection methods results in co-amplification of the desired protein coding sequences in the cells.

In another embodiment of the present invention, cells and tissues may be engineered to express an endogenous gene comprising the polynucleotides of the invention under the control of inducible regulatory elements, in which case the regulatory sequences of the

15   endogenous gene may be replaced by homologous recombination. As described herein, gene targeting can be used to replace a gene's existing regulatory region with a regulatory sequence isolated from a different gene or a novel regulatory sequence synthesized by genetic engineering methods. Such regulatory sequences may be comprised of promoters, enhancers, scaffold-attachment regions, negative regulatory elements, transcriptional

20   initiation sites, regulatory protein binding sites or combinations of said sequences. Alternatively, sequences which affect the structure or stability of the RNA or protein produced may be replaced, removed, added, or otherwise modified by targeting. These sequences include polyadenylation signals, mRNA stability elements, splice sites, leader sequences for enhancing or modifying transport or secretion properties of the protein, or

25   other sequences which alter or improve the function or stability of protein or RNA molecules.

The targeting event may be a simple insertion of the regulatory sequence, placing the gene under the control of the new regulatory sequence, e.g., inserting a new promoter or enhancer or both upstream of a gene. Alternatively, the targeting event may be a simple

30   deletion of a regulatory element, such as the deletion of a tissue-specific negative regulatory element. Alternatively, the targeting event may replace an existing element; for example, a

tissue-specific enhancer can be replaced by an enhancer that has broader or different

cell-type specificity than the naturally occurring elements. Here, the naturally occurring

sequences are deleted and new sequences are added. In all cases, the identification of the

targeting event may be facilitated by the use of one or more selectable marker genes that are

5   contiguous with the targeting DNA, allowing for the selection of cells in which the

exogenous DNA has integrated into the cell genome. The identification of the targeting

event may also be facilitated by the use of one or more marker genes exhibiting the property

of negative selection, such that the negatively selectable marker is linked to the exogenous

DNA, but configured such that the negatively selectable marker flanks the targeting

10   sequence, and such that a correct homologous recombination event with sequences in the

host cell genome does not result in the stable integration of the negatively selectable marker.

Markers useful for this purpose include the Herpes Simplex Virus thymidine kinase (TK)

gene or the bacterial xanthine-guanine phosphoribosyl-transferase (gpt) gene.

          The gene targeting or gene activation techniques which can be used in accordance

15   with this aspect of the invention are more particularly described in U.S. Patent No.

5,272,071 to Chappel; U.S. Patent No. 5,578,461 to Sherwin et al.; International Application

No. PCT/US92/09627 (WO93/09222) by Selden et al.; and International Application No.

PCT/US90/06436 (WO91/06667) by Skoultchi et al., each of which is incorporated by

reference herein in its entirety.

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4.9 TRANSGENIC ANIMALS

          In preferred methods to determine biological functions of the polypeptides of the

invention in vivo, one or more genes provided by the invention are either over expressed

or inactivated in the germ line of animals using homologous recombination [Capecchi,

25   Science 244:1288-1292 (1989)]. Animals in which the gene is over expressed, under the

regulatory control of exogenous or endogenous promoter elements, are known as

transgenic animals. Animals in which an endogenous gene has been inactivated by

homologous recombination are referred to as "knockout" animals. Knockout animals,

preferably non-human mammals, can be prepared as described in U.S. Patent No.

30   5,557,032, incorporated herein by reference. Transgenic animals are useful to determine

the roles polypeptides of the invention play in biological processes, and preferably in

disease states. Transgenic animals are useful as model systems to identify compounds that modulate lipid metabolism. Transgenic animals, preferably non-human mammals, are produced using methods as described in U.S. Patent No 5,489,743 and PCT . Publication No. WO94/28122, incorporated herein by reference.

5   Transgenic animals can be prepared wherein all or part of a promoter of the polynucleotides of the invention is either activated or inactivated to alter the level of expression of the polypeptides of the invention. Inactivation can be carried out using homologous recombination methods described above. Activation can be achieved by supplementing or even replacing the homologous promoter to provide for increased 10 protein expression. The homologous promoter can be supplemented by insertion of one or more heterologous enhancer elements known to confer promoter activation in a particular tissue.

   The polynucleotides of the present invention also make possible the development, through, e.g., homologous recombination or knock out strategies, of animals that fail to 15 express polypeptides of the invention or that express a variant polypeptide. Such animals are useful as models for studying the *in vivo* activities of polypeptide as well as for studying modulators of the polypeptides of the invention.

   In preferred methods to determine biological functions of the polypeptides of the invention *in vivo*, one or more genes provided by the invention are either over expressed 20 or inactivated in the germ line of animals using homologous recombination [Capecchi, Science 244:1288-1292 (1989)]. Animals in which the gene is over expressed, under the regulatory control of exogenous or endogenous promoter elements, are known as transgenic animals. Animals in which an endogenous gene has been inactivated by homologous recombination are referred to as "knockout" animals. Knockout animals, 25 preferably non-human mammals, can be prepared as described in U.S. Patent No. 5,557,032, incorporated herein by reference. Transgenic animals are useful to determine the roles polypeptides of the invention play in biological processes, and preferably in disease states. Transgenic animals are useful as model systems to identify compounds that modulate lipid metabolism. Transgenic animals, preferably non-human mammals, 30 are produced using methods as described in U.S. Patent No 5,489,743 and PCT Publication No. WO94/28122, incorporated herein by reference.

Transgenic animals can be prepared wherein all or part of the polynucleotides of the invention promoter is either activated or inactivated to alter the level of expression of the polypeptides of the invention. Inactivation can be carried out using homologous recombination methods described above. Activation can be achieved by supplementing or

5   even replacing the homologous promoter to provide for increased protein expression. The homologous promoter can be supplemented by insertion of one or more heterologous enhancer elements known to confer promoter activation in a particular tissue.

4.10 USES AND BIOLOGICAL ACTIVITY

10   The polynucleotides and proteins of the present invention are expected to exhibit one or more of the uses or biological activities (including those associated with assays cited herein) identified herein. Uses or activities described for proteins of the present invention may be provided by administration or use of such proteins or of polynucleotides encoding such proteins (such as, for example, in gene therapies or

15   vectors suitable for introduction of DNA). The mechanism underlying the particular condition or pathology will dictate whether the polypeptides of the invention, the polynucleotides of the invention or modulators (activators or inhibitors) thereof would be beneficial to the subject in need of treatment. Thus, "therapeutic compositions of the invention" include compositions comprising isolated polynucleotides (including

20   recombinant DNA molecules, cloned genes and degenerate variants thereof) or polypeptides of the invention (including full length protein, mature protein and truncations or domains thereof), or compounds and other substances that modulate the overall activity of the target gene products, either at the level of target gene/protein expression or target protein activity. Such modulators include polypeptides, analogs,

25   (variants), including fragments and fusion proteins, antibodies and other binding proteins; chemical compounds that directly or indirectly activate or inhibit the polypeptides of the invention (identified, e.g., via drug screening assays as described herein); antisense polynucleotides and polynucleotides suitable for triple helix formation; and in particular antibodies or other binding partners that specifically recognize one or more epitopes of

30   the polypeptides of the invention.

The polypeptides of the present invention may likewise be involved in cellular activation or in one of the other physiological pathways described herein.

4.10.1 RESEARCH USES AND UTILITIES

5   The polynucleotides provided by the present invention can be used by the research community for various purposes. The polynucleotides can be used to express recombinant protein for analysis, characterization or therapeutic use; as markers for tissues in which the corresponding protein is preferentially expressed (either constitutively or at a particular stage of tissue differentiation or development or in disease

10   states); as molecular weight markers on gels; as chromosome markers or tags (when labeled) to identify chromosomes or to map related gene positions; to compare with endogenous DNA sequences in patients to identify potential genetic disorders; as probes to hybridize and thus discover novel, related DNA sequences; as a source of information to derive PCR primers for genetic fingerprinting; as a probe to "subtract-out" known

15   sequences in the process of discovering other novel polynucleotides; for selecting and making oligomers for attachment to a "gene chip" or other support, including for examination of expression patterns; to raise anti-protein antibodies using DNA immunization techniques; and as an antigen to raise anti-DNA antibodies or elicit another immune response. Where the polynucleotide encodes a protein which binds or

20   potentially binds to another protein (such as, for example, in a receptor-ligand interaction), the polynucleotide can also be used in interaction trap assays (such as, for example, that described in Gyuris et al., Cell 75:791-803 (1993)) to identify polynucleotides encoding the other protein with which binding occurs or to identify inhibitors of the binding interaction.

25   The polypeptides provided by the present invention can similarly be used in assays to determine biological activity, including in a panel of multiple proteins for high-throughput screening; to raise antibodies or to elicit another immune response; as a reagent (including the labeled reagent) in assays designed to quantitatively determine levels of the protein (or its receptor) in biological fluids; as markers for tissues in which

30   the corresponding polypeptide is preferentially expressed (either constitutively or at a particular stage of tissue differentiation or development or in a disease state); and, of

course, to isolate correlative receptors or ligands. Proteins involved in these binding interactions can also be used to screen for peptide or small molecule inhibitors or ago: of the binding interaction.

Any or all of these research utilities are capable of being developed into reager

5   grade or kit format for commercialization as research products.

Methods for performing the uses listed above are well known to those skilled ii the art. References disclosing such methods include without limitation "Molecular Cloning: A Laboratory Manual", 2d ed., Cold Spring Harbor Laboratory Press, Sambrook, J., E. F. Fritsch and T. Maniatis eds., 1989, and "Methods in Enzymology:

10   Guide to Molecular Cloning Techniques", Academic Press, Berger, S. L. and A. R. Kimmel eds., 1987.

4.10.2 NUTRITIONAL USES

Polynucleotides and polypeptides of the present invention can also be used as

15   nutritional sources or supplements. Such uses include without limitation use as a protein or amino acid supplement, use as a carbon source, use as a nitrogen source and use as a source of carbohydrate. In such cases the polypeptide or polynucleotide of the invention can be added to the feed of a particular organism or can be administered as a separate solid or liquid preparation, such as in the form of powder, pills, solutions, suspensions or capsules. In the

20   case of microorganisms, the polypeptide or polynucleotide of the invention can be added to the medium in or on which the microorganism is cultured.

4.10.3 CYTOKINE AND CELL PROLIFERATION/DIFFERENTIATION ACTIVITY

25   A polypeptide of the present invention may exhibit activity relating to cytokine, cell proliferation (either inducing or inhibiting) or cell differentiation (either inducing or inhibiting) activity or may induce production of other cytokines in certain cell populations. A polynucleotide of the invention can encode a polypeptide exhibiting such attributes. Many protein factors discovered to date, including all known cytokines, have

30   exhibited activity in one or more factor-dependent cell proliferation assays, and hence the assays serve as a convenient confirmation of cytokine activity. The activity of therapeutic

compositions of the present invention is evidenced by any one of a number of routine

factor dependent cell proliferation assays for cell lines including, without limitation, 32D,

DA2, DA1G, T10, B9, B9/11, BaF3, MC9/G, M+(preB M+), 2E8, RB5, DA1, 123,

T1165, HT2, CTLL2, TF-1, Mo7e, CMK, HUVEC, and Caco. Therapeutic compositions

5   of the invention can be used in the following:

Assays for T-cell or thymocyte proliferation include without limitation those

described in: Current Protocols in Immunology, Ed by J. E. Coligan, A. M. Kruisbeek, D.

H. Margulies, E. M. Shevach, W. Strober, Pub. Greene Publishing Associates and

Wiley-Interscience (Chapter 3, *In Vitro* assays for Mouse Lymphocyte Function 3.1-3.19;

10   Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol. 137:3494-3500,

1986; Bertagnolli et al., J. Immunol. 145:1706-1712, 1990; Bertagnolli et al., Cellular

Immunology 133:327-341, 1991; Bertagnolli, et al., I. Immunol. 149:3778-3783, 1992;

Bowman et al., I. Immunol. 152:1756-1761, 1994.

Assays for cytokine production and/or proliferation of spleen cells, lymph node

15   cells or thymocytes include, without limitation, those described in: Polyclonal T cell

stimulation, Kruisbeek, A. M. and Shevach, E. M. In Current Protocols in Immunology.

J. E. e.a. Coligan eds. Vol 1 pp. 3.12.1-3.12.14, John Wiley and Sons, Toronto. 1994; and

Measurement of mouse and human interleukin-γ, Schreiber, R. D. In Current Protocols in

Immunology. J. E. e.a. Coligan eds. Vol 1 pp. 6.8.1-6.8.8, John Wiley and Sons, Toronto.

20   1994.

Assays for proliferation and differentiation of hematopoietic and lymphopoietic

cells include, without limitation, those described in: Measurement of Human and Murine

Interleukin 2 and Interleukin 4, Bottomly, K., Davis, L. S. and Lipsky, P. E. In Current

Protocols in Immunology. J. E. e.a. Coligan eds. Vol 1 pp. 6.3.1-6.3.12, John Wiley and

25   Sons, Toronto. 1991; deVries et al., J. Exp. Med. 173:1205-1211, 1991; Moreau et al.,

Nature 336:690-692, 1988; Greenberger et al., Proc. Natl. Acad. Sci. U.S.A.

80:2931-2938, 1983; Measurement of mouse and human interleukin 6--Nordan, R. In

Current Protocols in Immunology. J. E. Coligan eds. Vol 1 pp. 6.6.1-6.6.5, John Wiley

and Sons, Toronto. 1991; Smith et al., Proc. Natl. Aced. Sci. U.S.A. 83:1857-1861, 1986;

30   Measurement of human Interleukin 11--Bennett, F., Giannotti, J., Clark, S. C. and Turner,

K. J. In Current Protocols in Immunology. J. E. Coligan eds. Vol 1 pp. 6.15.1 John

Wiley and Sons, Toronto. 1991; Measurement of mouse and human Interleukin
9--Ciarletta, A., Giannotti, J., Clark, S. C. and Turner, K. J. In Current Protocols in
Immunology. J. E. Coligan eds. Vol 1 pp. 6.13.1, John Wiley and Sons, Toronto. 1991.

Assays for T-cell clone responses to antigens (which will identify, among others,

5   proteins that affect APC-T cell interactions as well as direct T-cell effects by measuring
proliferation and cytokine production) include, without limitation, those described in:
Current Protocols in Immunology, Ed by J. E. Coligan, A. M. Kruisbeek, D. H.
Margulies, E. M. Shevach, W Strober, Pub. Greene Publishing Associates and
Wiley-Interscience (Chapter 3, *In Vitro* assays for Mouse Lymphocyte Function; Chapter

10   6, Cytokines and their cellular receptors; Chapter 7, Immunologic studies in Humans);
Weinberger et al., Proc. Natl. Acad. Sci. USA 77:6091-6095, 1980; Weinberger et al.,
Eur. J. Immun. 11:405-411, 1981; Takai et al., J. Immunol. 137:3494-3500, 1986; Takai
et al., J. Immunol. 140:508-512, 1988.

15   **4.10.4   STEM CELL GROWTH FACTOR ACTIVITY**

A polypeptide of the present invention may exhibit stem cell growth factor
activity and be involved in the proliferation, differentiation and survival of pluripotent
and totipotent stem cells including primordial germ cells, embryonic stem cells,
hematopoietic stem cells and/or germ line stem cells. Administration of the polypeptide

20   of the invention to stem cells *in vivo* or *ex vivo* is expected to maintain and expand cell
populations in a totipotential or pluripotential state which would be useful for re-
engineering damaged or diseased tissues, transplantation, manufacture of bio-
pharmaceuticals and the development of bio-sensors. The ability to produce large
quantities of human cells has important working applications for the production of human

25   proteins which currently must be obtained from non-human sources or donors,
implantation of cells to treat diseases such as Parkinson's, Alzheimer's and other
neurodegenerative diseases; tissues for grafting such as bone marrow, skin, cartilage,
tendons, bone, muscle (including cardiac muscle), blood vessels, cornea, neural cells,
gastrointestinal cells and others; and organs for transplantation such as kidney, liver,

30   pancreas (including islet cells), heart and lung.

49

It is contemplated that multiple different exogenous growth factors and/or cytokines may be administered in combination with the polypeptide of the invention to achieve the desired effect, including any of the growth factors listed herein, other stem cell maintenance factors, and specifically including stem cell factor (SCF), leukemia

5   inhibitory factor (LIF), Flt-3 ligand (Flt-3L), any of the interleukins, recombinant soluble IL-6 receptor fused to IL-6, macrophage inflammatory protein 1-alpha (MIP-1-alpha), G-CSF, GM-CSF, thrombopoietin (TPO), platelet factor 4 (PF-4), platelet-derived growth factor (PDGF), neural growth factors and basic fibroblast growth factor (bFGF).

Since totipotent stem cells can give rise to virtually any mature cell type,

10   expansion of these cells in culture will facilitate the production of large quantities of mature cells. Techniques for culturing stem cells are known in the art and administration of polypeptides of the invention, optionally with other growth factors and/or cytokines, is expected to enhance the survival and proliferation of the stem cell populations. This can be accomplished by direct administration of the polypeptide of the invention to the

15   culture medium. Alternatively, stroma cells transfected with a polynucleotide that encodes for the polypeptide of the invention can be used as a feeder layer for the stem cell populations in culture or in vivo. Stromal support cells for feeder layers may include embryonic bone marrow fibroblasts, bone marrow stromal cells, fetal liver cells, or cultured embryonic fibroblasts (see U.S. Patent No. 5,690,926).

20   Stem cells themselves can be transfected with a polynucleotide of the invention to induce autocrine expression of the polypeptide of the invention. This will allow for generation of undifferentiated totipotential/pluripotential stem cell lines that are useful as is or that can then be differentiated into the desired mature cell types. These stable cell lines can also serve as a source of undifferentiated totipotential/pluripotential mRNA to

25   create cDNA libraries and templates for polymerase chain reaction experiments. These studies would allow for the isolation and identification of differentially expressed genes in stem cell populations that regulate stem cell proliferation and/or maintenance.

Expansion and maintenance of totipotent stem cell populations will be useful in the treatment of many pathological conditions. For example, polypeptides of the present

30   invention may be used to manipulate stem cells in culture to give rise to neuroepithelial cells that can be used to augment or replace cells damaged by illness, autoimmune

disease, accidental damage or genetic disorders. The polypeptide of the invention may be useful for inducing the proliferation of neural cells and for the regeneration of nerve and brain tissue, i.e. for the treatment of central and peripheral nervous system diseases and neuropathies, as well as mechanical and traumatic disorders which involve degeneration,

5   death or trauma to neural cells or nerve tissue. In addition, the expanded stem cell populations can also be genetically altered for gene therapy purposes and to decrease host rejection of replacement tissues after grafting or implantation.

Expression of the polypeptide of the invention and its effect on stem cells can also be manipulated to achieve controlled differentiation of the stem cells into more

10   differentiated cell types. A broadly applicable method of obtaining pure populations of a specific differentiated cell type from undifferentiated stem cell populations involves the use of a cell-type specific promoter driving a selectable marker. The selectable marker allows only cells of the desired type to survive. For example, stem cells can be induced to differentiate into cardiomyocytes (Wobus et al., Differentiation, 48: 173-182, (1991);

15   Klug et al., J. Clin. Invest., 98(1): 216-224, (1998)) or skeletal muscle cells (Browder, L. W. In: *Principles of Tissue Engineering eds.* Lanza et al., Academic Press (1997)). Alternatively, directed differentiation of stem cells can be accomplished by culturing the stem cells in the presence of a differentiation factor such as retinoic acid and an antagonist of the polypeptide of the invention which would inhibit the effects of

20   endogenous stem cell factor activity and allow differentiation to proceed.

In vitro cultures of stem cells can be used to determine if the polypeptide of the invention exhibits stem cell growth factor activity. Stem cells are isolated from any one of various cell sources (including hematopoietic stem cells and embryonic stem cells) and cultured on a feeder layer, as described by Thompson et al. Proc. Natl. Acad. Sci, U.S.A.,

25   92: 7844-7848 (1995), in the presence of the polypeptide of the invention alone or in combination with other growth factors or cytokines. The ability of the polypeptide of the invention to induce stem cells proliferation is determined by colony formation on semi-solid support e.g. as described by Bernstein et al., Blood, 77: 2316-2321 (1991).

30   **4.10.5 HEMATOPOIESIS REGULATING ACTIVITY**

A polypeptide of the present invention may be involved in regulation of hematopoiesis and, consequently, in the treatment of myeloid or lymphoid cell disorders. Even marginal biological activity in support of colony forming cells or of factor-dependent cell lines indicates involvement in regulating hematopoiesis, e.g. in

5   supporting the growth and proliferation of erythroid progenitor cells alone or in combination with other cytokines, thereby indicating utility, for example, in treating various anemias or for use in conjunction with irradiation/chemotherapy to stimulate the production of erythroid precursors and/or erythroid cells; in supporting the growth and proliferation of myeloid cells such as granulocytes and monocytes/macrophages (i.e.,

10   traditional CSF activity) useful, for example, in conjunction with chemotherapy to prevent or treat consequent myelo-suppression; in supporting the growth and proliferation of megakaryocytes and consequently of platelets thereby allowing prevention or treatment of various platelet disorders such as thrombocytopenia, and generally for use in place of or complimentary to platelet transfusions; and/or in supporting the growth and

15   proliferation of hematopoietic stem cells which are capable of maturing to any and all of the above-mentioned hematopoietic cells and therefore find therapeutic utility in various stem cell disorders (such as those usually treated with transplantation, including, without limitation, aplastic anemia and paroxysmal nocturnal hemoglobinuria), as well as in repopulating the stem cell compartment post irradiation/chemotherapy, either *in-vivo* or

20   *ex-vivo* (i.e., in conjunction with bone marrow transplantation or with peripheral progenitor cell transplantation (homologous or heterologous)) as normal cells or genetically manipulated for gene therapy.

Therapeutic compositions of the invention can be used in the following:

Suitable assays for proliferation and differentiation of various hematopoietic lines

25   are cited above.

Assays for embryonic stem cell differentiation (which will identify, among others, proteins that influence embryonic differentiation hematopoiesis) include, without limitation, those described in: Johansson et al. Cellular Biology 15:141-151, 1995; Keller et al., Molecular and Cellular Biology 13:473-486, 1993; McClanahan et al., Blood

30   81:2903-2915, 1993.

Assays for stem cell survival and differentiation (which will identify, among others, proteins that regulate lympho-hematopoiesis) include, without limitation, those described in: Methylcellulose colony forming assays, Freshney, M. G. In Culture of Hematopoietic Cells. R. I. Freshney, et al. eds. Vol pp. 265-268, Wiley-Liss, Inc., New

5   York, N.Y. 1994; Hirayama et al., Proc. Natl. Acad. Sci. USA 89:5907-5911, 1992; Primitive hematopoietic colony forming cells with high proliferative potential, McNiece, I. K. and Briddell, R. A. In Culture of Hematopoietic Cells. R. I. Freshney, et al. eds. Vol pp. 23-39, Wiley-Liss, Inc., New York, N.Y. 1994; Neben et al., Experimental Hematology 22:353-359, 1994; Cobblestone area forming cell assay, Ploemacher, R. E.

10 In Culture of Hematopoietic Cells. R. I. Freshney, et al. eds. Vol pp. 1-21, Wiley-Liss, Inc., New York, N.Y. 1994; Long term bone marrow cultures in the presence of stromal cells, Spooncer, E., Dexter, M. and Allen, T. In Culture of Hematopoietic Cells. R. I. Freshney, et al. eds. Vol pp. 163-179, Wiley-Liss, Inc., New York, N.Y. 1994; Long term culture initiating cell assay, Sutherland, H. J. In Culture of Hematopoietic Cells. R. I.

15 Freshney, et al. eds. Vol pp. 139-162, Wiley-Liss, Inc., New York, N.Y. 1994.

4.10.6 TISSUE GROWTH ACTIVITY

A polypeptide of the present invention also may be involved in bone, cartilage, tendon, ligament and/or nerve tissue growth or regeneration, as well as in wound healing

20 and tissue repair and replacement, and in healing of burns, incisions and ulcers.

A polypeptide of the present invention which induces cartilage and/or bone growth in circumstances where bone is not normally formed, has application in the healing of bone fractures and cartilage damage or defects in humans and other animals. Compositions of a polypeptide, antibody, binding partner, or other modulator of the

25 invention may have prophylactic use in closed as well as open fracture reduction and also in the improved fixation of artificial joints. De novo bone formation induced by an osteogenic agent contributes to the repair of congenital, trauma induced, or oncologic resection induced craniofacial defects, and also is useful in cosmetic plastic surgery.

A polypeptide of this invention may also be involved in attracting bone-forming

30 cells, stimulating growth of bone-forming cells, or inducing differentiation of progenitors of bone-forming cells. Treatment of osteoporosis, osteoarthritis, bone degenerative

disorders, or periodontal disease, such as through stimulation of bone and/or cartilage repair or by blocking inflammation or processes of tissue destruction (collagenase activity, osteoclast activity, etc.) mediated by inflammatory processes may also be possible using the composition of the invention.

5   Another category of tissue regeneration activity that may involve the polypeptide of the present invention is tendon/ligament formation. Induction of tendon/ligament-like tissue or other tissue formation in circumstances where such tissue is not normally formed, has application in the healing of tendon or ligament tears, deformities and other tendon or ligament defects in humans and other animals. Such a preparation employing a
10   tendon/ligament-like tissue inducing protein may have prophylactic use in preventing damage to tendon or ligament tissue, as well as use in the improved fixation of tendon or ligament to bone or other tissues, and in repairing defects to tendon or ligament tissue. De novo tendon/ligament-like tissue formation induced by a composition of the present invention contributes to the repair of congenital, trauma induced, or other tendon or
15   ligament defects of other origin, and is also useful in cosmetic plastic surgery for attachment or repair of tendons or ligaments. The compositions of the present invention may provide environment to attract tendon- or ligament-forming cells, stimulate growth of tendon- or ligament-forming cells, induce differentiation of progenitors of tendon- or ligament-forming cells, or induce growth of tendon/ligament cells or progenitors *ex vivo*
20   for return *in vivo* to effect tissue repair. The compositions of the invention may also be useful in the treatment of tendinitis, carpal tunnel syndrome and other tendon or ligament defects. The compositions may also include an appropriate matrix and/or sequestering agent as a carrier as is well known in the art.

          The compositions of the present invention may also be useful for proliferation of
25   neural cells and for regeneration of nerve and brain tissue, i.e. for the treatment of central and peripheral nervous system diseases and neuropathies, as well as mechanical and traumatic disorders, which involve degeneration, death or trauma to neural cells or nerve tissue. More specifically, a composition may be used in the treatment of diseases of the peripheral nervous system, such as peripheral nerve injuries, peripheral neuropathy and
30   localized neuropathies, and central nervous system diseases, such as Alzheimer's, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, and Shy-Drager

syndrome. Further conditions which may be treated in accordance with the present

invention include mechanical and traumatic disorders, such as spinal cord disorders, head

trauma and cerebrovascular diseases such as stroke. Peripheral neuropathies resulting

from chemotherapy or other medical therapies may also be treatable using a composition

5   of the invention.

Compositions of the invention may also be useful to promote better or faster

closure of non-healing wounds, including without limitation pressure ulcers, ulcers

associated with vascular insufficiency, surgical and traumatic wounds, and the like.

Compositions of the present invention may also be involved in the generation or

10   regeneration of other tissues, such as organs (including, for example, pancreas, liver,

intestine, kidney, skin, endothelium), muscle (smooth, skeletal or cardiac) and vascular

(including vascular endothelium) tissue, or for promoting the growth of cells comprising

such tissues. Part of the desired effects may be by inhibition or modulation of fibrotic

scarring may allow normal tissue to regenerate. A polypeptide of the present invention

15   may also exhibit angiogenic activity.

A composition of the present invention may also be useful for gut protection or

regeneration and treatment of lung or liver fibrosis, reperfusion injury in various tissues,

and conditions resulting from systemic cytokine damage.

A composition of the present invention may also be useful for promoting or

20   inhibiting differentiation of tissues described above from precursor tissues or cells; or for

inhibiting the growth of tissues described above.

Therapeutic compositions of the invention can be used in the following:

Assays for tissue generation activity include, without limitation, those described

in: International Patent Publication No. WO95/16035 (bone, cartilage, tendon);

25   International Patent Publication No. WO95/05846 (nerve, neuronal); International Patent

Publication No. WO91/07491 (skin, endothelium).

Assays for wound healing activity include, without limitation, those described in:

Winter, Epidermal Wound Healing, pps. 71-112 (Maibach, H. I. and Rovee, D. T., eds.),

Year Book Medical Publishers, Inc., Chicago, as modified by Eaglstein and Mertz, J.

30   Invest. Dermatol 71:382-84 (1978).

4.10.7 IMMUNE STIMULATING OR SUPPRESSING ACTIVITY

A polypeptide of the present invention may also exhibit immune stimulating or immune suppressing activity, including without limitation the activities for which assays are described herein. A polynucleotide of the invention can encode a polypeptide

5   exhibiting such activities. A protein may be useful in the treatment of various immune deficiencies and disorders (including severe combined immunodeficiency (SCID)), e.g., in regulating (up or down) growth and proliferation of T and/or B lymphocytes, as well as effecting the cytolytic activity of NK cells and other cell populations. These immune deficiencies may be genetic or be caused by viral (e.g., HIV) as well as bacterial or

10   fungal infections, or may result from autoimmune disorders. More specifically, infectious diseases causes by viral, bacterial, fungal or other infection may be treatable using a protein of the present invention, including infections by HIV, hepatitis viruses, herpes viruses, mycobacteria, Leishmania spp., malaria spp. and various fungal infections such as candidiasis. Of course, in this regard, proteins of the present invention may also be

15   useful where a boost to the immune system generally may be desirable, i.e., in the treatment of cancer.

Autoimmune disorders which may be treated using a protein of the present invention include, for example, connective tissue disease, multiple sclerosis, systemic lupus erythematosus, rheumatoid arthritis, autoimmune pulmonary inflammation,

20   Guillain-Barre syndrome, autoimmune thyroiditis, insulin dependent diabetes mellitis, myasthenia gravis, graft-versus-host disease and autoimmune inflammatory eye disease. Such a protein (or antagonists thereof, including antibodies) of the present invention may also to be useful in the treatment of allergic reactions and conditions (*e.g.*, anaphylaxis, serum sickness, drug reactions, food allergies, insect venom allergies, mastocytosis,

25   allergic rhinitis, hypersensitivity pneumonitis, urticaria, angioedema, eczema, atopic dermatitis, allergic contact dermatitis, erythema multiforme, Stevens-Johnson syndrome, allergic conjunctivitis, atopic keratoconjunctivitis, venereal keratoconjunctivitis, giant papillary conjunctivitis and contact allergies), such as asthma (particularly allergic asthma) or other respiratory problems. Other conditions, in which immune suppression is

30   desired (including, for example, organ transplantation), may also be treatable using a protein (or antagonists thereof) of the present invention. The therapeutic effects of the

polypeptides or antagonists thereof on allergic reactions can be evaluated by in vivo animals models such as the cumulative contact enhancement test (Lastbom et al., Toxicology 125: 59-66, 1998), skin prick test (Hoffmann et al., Allergy 54: 446-54, 1999), guinea pig skin sensitization test (Vohr et al., Arch. Toxocol. 73: 501-9), and

5   murine local lymph node assay (Kimber et al., J. Toxicol. Environ. Health 53: 563-79).

Using the proteins of the invention it may also be possible to modulate immune responses, in a number of ways. Down regulation may be in the form of inhibiting or blocking an immune response already in progress or may involve preventing the induction of an immune response. The functions of activated T cells may be inhibited by

10   suppressing T cell responses or by inducing specific tolerance in T cells, or both. Immunosuppression of T cell responses is generally an active, non-antigen-specific, process which requires continuous exposure of the T cells to the suppressive agent. Tolerance, which involves inducing non-responsiveness or anergy in T cells, is distinguishable from immunosuppression in that it is generally antigen-specific and

15   persists after exposure to the tolerizing agent has ceased. Operationally, tolerance can be demonstrated by the lack of a T cell response upon reexposure to specific antigen in the absence of the tolerizing agent.

Down regulating or preventing one or more antigen functions (including without limitation B lymphocyte antigen functions (such as, for example, B7)), e.g., preventing

20   high level lymphokine synthesis by activated T cells, will be useful in situations of tissue, skin and organ transplantation and in graft-versus-host disease (GVHD). For example, blockage of T cell function should result in reduced tissue destruction in tissue transplantation. Typically, in tissue transplants, rejection of the transplant is initiated through its recognition as foreign by T cells, followed by an immune reaction that

25   destroys the transplant. The administration of a therapeutic composition of the invention may prevent cytokine synthesis by immune cells, such as T cells, and thus acts as an immunosuppressant. Moreover, a lack of costimulation may also be sufficient to anergize the T cells, thereby inducing tolerance in a subject. Induction of long-term tolerance by B lymphocyte antigen-blocking reagents may avoid the necessity of repeated administration

30   of these blocking reagents. To achieve sufficient immunosuppression or tolerance in a

subject, it may also be necessary to block the function of a combination of B lymphocyte antigens.

The efficacy of particular therapeutic compositions in preventing organ transplant rejection or GVHD can be assessed using animal models that are predictive of efficacy in

5   humans. Examples of appropriate systems which can be used include allogeneic cardiac grafts in rats and xenogeneic pancreatic islet cell grafts in mice, both of which have been used to examine the immunosuppressive effects of CTLA4Ig fusion proteins in vivo as described in Lenschow et al., Science 257:789-792 (1992) and Turka et al., Proc. Natl. Acad. Sci USA, 89:11102-11105 (1992). In addition, murine models of GVHD (see Paul

10   ed., Fundamental Immunology, Raven Press, New York, 1989, pp. 846-847) can be used to determine the effect of therapeutic compositions of the invention on the development of that disease.

Blocking antigen function may also be therapeutically useful for treating autoimmune diseases. Many autoimmune disorders are the result of inappropriate

15   activation of T cells that are reactive against self tissue and which promote the production of cytokines and autoantibodies involved in the pathology of the diseases. Preventing the activation of autoreactive T cells may reduce or eliminate disease symptoms. Administration of reagents which block stimulation of T cells can be used to inhibit T cell activation and prevent production of autoantibodies or T cell-derived cytokines

20   which may be involved in the disease process. Additionally, blocking reagents may induce antigen-specific tolerance of autoreactive T cells which could lead to long-term relief from the disease. The efficacy of blocking reagents in preventing or alleviating autoimmune disorders can be determined using a number of well-characterized animal models of human autoimmune diseases. Examples include murine experimental

25   autoimmune encephalitis, systemic lupus erythmatosis in MRL/lpr/lpr mice or NZB hybrid mice, murine autoimmune collagen arthritis, diabetes mellitus in NOD mice and BB rats, and murine experimental myasthenia gravis (see Paul ed., Fundamental Immunology, Raven Press, New York, 1989, pp. 840-856).

Upregulation of an antigen function (e.g., a B lymphocyte antigen function), as a

30   means of up regulating immune responses, may also be useful in therapy. Upregulation of immune responses may be in the form of enhancing an existing immune response or

eliciting an initial immune response. For example, enhancing an immune response may be useful in cases of viral infection, including systemic viral diseases such as influenza, the common cold, and encephalitis.

Alternatively, anti-viral immune responses may be enhanced in an infected patient
5   by removing T cells from the patient, costimulating the T cells in vitro with viral antigen-pulsed APCs either expressing a peptide of the present invention or together with a stimulatory form of a soluble peptide of the present invention and reintroducing the in vitro activated T cells into the patient. Another method of enhancing anti-viral immune responses would be to isolate infected cells from a patient, transfect them with a nucleic
10   acid encoding a protein of the present invention as described herein such that the cells express all or a portion of the protein on their surface, and reintroduce the transfected cells into the patient. The infected cells would now be capable of delivering a costimulatory signal to, and thereby activate, T cells in vivo.

A polypeptide of the present invention may provide the necessary stimulation
15   signal to T cells to induce a T cell mediated immune response against the transfected tumor cells. In addition, tumor cells which lack MHC class I or MHC class II molecules, or which fail to reexpress sufficient mounts of MHC class I or MHC class II molecules, can be transfected with nucleic acid encoding all or a portion of (e.g., a cytoplasmic-domain truncated portion) of an MHC class I alpha chain protein and β_2
20   microglobulin protein or an MHC class II alpha chain protein and an MHC class II beta chain protein to thereby express MHC class I or MHC class II proteins on the cell surface. Expression of the appropriate class I or class II MHC in conjunction with a peptide having the activity of a B lymphocyte antigen (e.g., B7-1, B7-2, B7-3) induces a T cell mediated immune response against the transfected tumor cell. Optionally, a gene
25   encoding an antisense construct which blocks expression of an MHC class II associated protein, such as the invariant chain, can also be cotransfected with a DNA encoding a peptide having the activity of a B lymphocyte antigen to promote presentation of tumor associated antigens and induce tumor specific immunity. Thus, the induction of a T cell mediated immune response in a human subject may be sufficient to overcome
30   tumor-specific tolerance in the subject.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Suitable assays for thymocyte or splenocyte cytotoxicity include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.

5   M. Kruisbeek, D. H. Margulies, E. M. Shevach, W. Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Herrmann et al., Proc. Natl. Acad. Sci. USA 78:2488-2492, 1981; Herrmann et al., J. Immunol. 128:1968-1974, 1982; Handa et al., J. Immunol. 135:1564-1572, 1985; Takai et al., I. Immunol.

10   137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988; Bowman et al., J. Virology 61:1992-1998; Bertagnolli et al., Cellular Immunology 133:327-341, 1991; Brown et al., J. Immunol. 153:3079-3092, 1994.

Assays for T-cell-dependent immunoglobulin responses and isotype switching (which will identify, among others, proteins that modulate T-cell dependent antibody

15   responses and that affect Th1/Th2 profiles) include, without limitation, those described in: Maliszewski, J. Immunol. 144:3028-3033, 1990; and Assays for B cell function: In vitro antibody production, Mond, J. J. and Brunswick, M. In Current Protocols in Immunology. J. E. e.a. Coligan eds. Vol 1 pp. 3.8.1-3.8.16, John Wiley and Sons, Toronto. 1994.

20   Mixed lymphocyte reaction (MLR) assays (which will identify, among others, proteins that generate predominantly Th1 and CTL responses) include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A. M. Kruisbeek, D. H. Margulies, E. M. Shevach, W. Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte

25   Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988; Bertagnolli et al., J. Immunol. 149:3778-3783, 1992.

Dendritic cell-dependent assays (which will identify, among others, proteins expressed by dendritic cells that activate naive T-cells) include, without limitation, those

30   described in: Guery et al., J. Immunol. 134:536-544, 1995; Inaba et al., Journal of Experimental Medicine 173:549-559, 1991; Macatonia et al., Journal of Immunology

154:5071-5079, 1995; Porgador et al., Journal of Experimental Medicine 182:255-260, 1995; Nair et al., Journal of Virology 67:4062-4069, 1993; Huang et al., Science 264:961-965, 1994; Macatonia et al., Journal of Experimental Medicine 169:1255-1264, 1989; Bhardwaj et al., Journal of Clinical Investigation 94:797-807, 1994; and Inaba et

5   al., Journal of Experimental Medicine 172:631-640, 1990.

Assays for lymphocyte survival/apoptosis (which will identify, among others, proteins that prevent apoptosis after superantigen induction and proteins that regulate lymphocyte homeostasis) include, without limitation, those described in: Darzynkiewicz et al., Cytometry 13:795-808, 1992; Gorczyca et al., Leukemia 7:659-670, 1993;

10   Gorczyca et al., Cancer Research 53:1945-1951, 1993; Itoh et al., Cell 66:233-243, 1991; Zacharchuk, Journal of Immunology 145:4037-4045, 1990; Zamai et al., Cytometry 14:891-897, 1993; Gorczyca et al., International Journal of Oncology 1:639-648, 1992.

Assays for proteins that influence early steps of T-cell commitment and development include, without limitation, those described in: Antica et al., Blood

15   84:111-117, 1994; Fine et al., Cellular Immunology 155:111-122, 1994; Galy et al., Blood 85:2770-2778, 1995; Toki et al., Proc. Nat. Acad Sci. USA 88:7548-7551, 1991.

4.10.8 ACTIVIN/INHIBIN ACTIVITY

A polypeptide of the present invention may also exhibit activin- or inhibin-related

20   activities. A polynucleotide of the invention may encode a polypeptide exhibiting such characteristics. Inhibins are characterized by their ability to inhibit the release of follicle stimulating hormone (FSH), while activins and are characterized by their ability to stimulate the release of follicle stimulating hormone (FSH). Thus, a polypeptide of the present invention, alone or in heterodimers with a member of the inhibin family, may be

25   useful as a contraceptive based on the ability of inhibins to decrease fertility in female mammals and decrease spermatogenesis in male mammals. Administration of sufficient amounts of other inhibins can induce infertility in these mammals. Alternatively, the polypeptide of the invention, as a homodimer or as a heterodimer with other protein subunits of the inhibin group, may be useful as a fertility inducing therapeutic, based

30   upon the ability of activin molecules in stimulating FSH release from cells of the anterior pituitary. See, for example, U.S. Pat. No. 4,798,885. A polypeptide of the invention may

also be useful for advancement of the onset of fertility in sexually immature mammals, so as to increase the lifetime reproductive performance of domestic animals such as, but not limited to, cows, sheep and pigs.

The activity of a polypeptide of the invention may, among other means, be
5   measured by the following methods.

Assays for activin/inhibin activity include, without limitation, those described in: Vale et al., Endocrinology 91:562-572, 1972; Ling et al., Nature 321:779-782, 1986; Vale et al., Nature 321:776-779, 1986; Mason et al., Nature 318:659-663, 1985; Forage et al., Proc. Natl. Acad. Sci. USA 83:3091-3095, 1986.

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4.10.9 CHEMOTACTIC/CHEMOKINETIC ACTIVITY

A polypeptide of the present invention may be involved in chemotactic or chemokinetic activity for mammalian cells, including, for example, monocytes, fibroblasts, neutrophils, T-cells, mast cells, eosinophils, epithelial and/or endothelial
15   cells. A polynucleotide of the invention can encode a polypeptide exhibiting such attributes. Chemotactic and chemokinetic receptor activation can be used to mobilize or attract a desired cell population to a desired site of action. Chemotactic or chemokinetic compositions (e.g. proteins, antibodies, binding partners, or modulators of the invention) provide particular advantages in treatment of wounds and other trauma to tissues, as well
20   as in treatment of localized infections. For example, attraction of lymphocytes, monocytes or neutrophils to tumors or sites of infection may result in improved immune responses against the tumor or infecting agent.

A protein or peptide has chemotactic activity for a particular cell population if it can stimulate, directly or indirectly, the directed orientation or movement of such cell
25   population. Preferably, the protein or peptide has the ability to directly stimulate directed movement of cells. Whether a particular protein has chemotactic activity for a population of cells can be readily determined by employing such protein or peptide in any known assay for cell chemotaxis.

Therapeutic compositions of the invention can be used in the following:
30   Assays for chemotactic activity (which will identify proteins that induce or prevent chemotaxis) consist of assays that measure the ability of a protein to induce the

migration of cells across a membrane as well as the ability of a protein to induce the

adhesion of one cell population to another cell population. Suitable assays for movement

and adhesion include, without limitation, those described in: Current Protocols in

Immunology, Ed by J. E. Coligan, A. M. Kruisbeek, D. H. Marguiles, E. M. Shevach, W.

5   Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 6.12,

Measurement of alpha and beta Chemokines 6.12.1-6.12.28; Taub et al. J. Clin. Invest.

95:1370-1376, 1995; Lind et al. APMIS 103:140-146, 1995; Muller et al Eur. J.

Immunol. 25:1744-1748; Gruber et al. J. of Immunol. 152:5860-5867, 1994; Johnston et

al. J. of Immunol. 153:1762-1768, 1994.

10

4.10.10   HEMOSTATIC AND THROMBOLYTIC ACTIVITY

A polypeptide of the invention may also be involved in hemostatis or

thrombolysis or thrombosis. A polynucleotide of the invention can encode a polypeptide

exhibiting such attributes. Compositions may be useful in treatment of various

15   coagulation disorders (including hereditary disorders, such as hemophilias) or to enhance

coagulation and other hemostatic events in treating wounds resulting from trauma,

surgery or other causes. A composition of the invention may also be useful for dissolving

or inhibiting formation of thromboses and for treatment and prevention of conditions

resulting therefrom (such as, for example, infarction of cardiac and central nervous

20   system vessels (e.g., stroke).

Therapeutic compositions of the invention can be used in the following:

Assay for hemostatic and thrombolytic activity include, without limitation, those

described in: Linet et al., J. Clin. Pharmacol. 26:131-140, 1986; Burdick et al.,

Thrombosis Res. 45:413-419, 1987; Humphrey et al., Fibrinolysis 5:71-79 (1991);

25   Schaub, Prostaglandins 35:467-474, 1988.

4.10.11   CANCER DIAGNOSIS AND THERAPY

Polypeptides of the invention may be involved in cancer cell generation,

proliferation or metastasis. Detection of the presence or amount of polynucleotides or

30   polypeptides of the invention may be useful for the diagnosis and/or prognosis of one or

more types of cancer. For example, the presence or increased expression of a

polynucleotide/polypeptide of the invention may indicate a hereditary risk of cancer, a precancerous condition, or an ongoing malignancy. Conversely, a defect in the gene or absence of the polypeptide may be associated with a cancer condition. Identification of single nucleotide polymorphisms associated with cancer or a predisposition to cancer

5   may also be useful for diagnosis or prognosis.

Cancer treatments promote tumor regression by inhibiting tumor cell proliferation, inhibiting angiogenesis (growth of new blood vessels that is necessary to support tumor growth) and/or prohibiting metastasis by reducing tumor cell motility or invasiveness. Therapeutic compositions of the invention may be effective in adult and

10   pediatric oncology including in solid phase tumors/malignancies, locally advanced tumors, human soft tissue sarcomas, metastatic cancer, including lymphatic metastases, blood cell malignancies including multiple myeloma, acute and chronic leukemias, and lymphomas, head and neck cancers including mouth cancer, larynx cancer and thyroid cancer, lung cancers including small cell carcinoma and non-small cell cancers, breast

15   cancers including small cell carcinoma and ductal carcinoma, gastrointestinal cancers including esophageal cancer, stomach cancer, colon cancer, colorectal cancer and polyps associated with colorectal neoplasia, pancreatic cancers, liver cancer, urologic cancers including bladder cancer and prostate cancer, malignancies of the female genital tract including ovarian carcinoma, uterine (including endometrial) cancers, and solid tumor in

20   the ovarian follicle, kidney cancers including renal cell carcinoma, brain cancers including intrinsic brain tumors, neuroblastoma, astrocytic brain tumors, gliomas, metastatic tumor cell invasion in the central nervous system, bone cancers including osteomas, skin cancers including malignant melanoma, tumor progression of human skin keratinocytes, squamous cell carcinoma, basal cell carcinoma, hemangiopericytoma and

25   Karposi's sarcoma.

Polypeptides, polynucleotides, or modulators of polypeptides of the invention (including inhibitors and stimulators of the biological activity of the polypeptide of the invention) may be administered to treat cancer. Therapeutic compositions can be administered in therapeutically effective dosages alone or in combination with adjuvant

30   cancer therapy such as surgery, chemotherapy, radiotherapy, thermotherapy, and laser therapy, and may provide a beneficial effect, e.g. reducing tumor size, slowing rate of

tumor growth, inhibiting metastasis, or otherwise improving overall clinical condition, without necessarily eradicating the cancer.

The composition can also be administered in therapeutically effective amounts as a portion of an anti-cancer cocktail. An anti-cancer cocktail is a mixture of the

5 polypeptide or modulator of the invention with one or more anti-cancer drugs in addition to a pharmaceutically acceptable carrier for delivery. The use of anti-cancer cocktails as a cancer treatment is routine. Anti-cancer drugs that are well known in the art and can be used as a treatment in combination with the polypeptide or modulator of the invention include: Actinomycin D, Aminoglutethimide, Asparaginase, Bleomycin, Busulfan,

10 Carboplatin, Carmustine, Chlorambucil, Cisplatin (cis-DDP), Cyclophosphamide, Cytarabine HCl (Cytosine arabinoside), Dacarbazine, Dactinomycin, Daunorubicin HCl, Doxorubicin HCl, Estramustine phosphate sodium, Etoposide (V16-213), Floxuridine, 5-Fluorouracil (5-Fu), Flutamide, Hydroxyurea (hydroxycarbamide), Ifosfamide, Interferon Alpha-2a, Interferon Alpha-2b, Leuprolide acetate (LHRH-releasing factor analog),

15 Lomustine, Mechlorethamine HCl (nitrogen mustard), Melphalan, Mercaptopurine, Mesna, Methotrexate (MTX), Mitomycin, Mitoxantrone HCl, Octreotide, Plicamycin, Procarbazine HCl, Streptozocin, Tamoxifen citrate, Thioguanine, Thiotepa, Vinblastine sulfate, Vincristine sulfate, Amsacrine, Azacitidine, Hexamethylmelamine, Interleukin-2, Mitoguazone, Pentostatin, Semustine, Teniposide, and Vindesine sulfate.

20 In addition, therapeutic compositions of the invention may be used for prophylactic treatment of cancer. There are hereditary conditions and/or environmental situations (e.g. exposure to carcinogens) known in the art that predispose an individual to developing cancers. Under these circumstances, it may be beneficial to treat these individuals with therapeutically effective doses of the polypeptide of the invention to

25 reduce the risk of developing cancers.

In vitro models can be used to determine the effective doses of the polypeptide of the invention as a potential cancer treatment. These in vitro models include proliferation assays of cultured tumor cells, growth of cultured tumor cells in soft agar (see Freshney, (1987) Culture of Animal Cells: A Manual of Basic Technique, Wily-Liss, New York,

30 NY Ch 18 and Ch 21), tumor systems in nude mice as described in Giovanella et al., J. Natl. Can. Inst., 52: 921-30 (1974), mobility and invasive potential of tumor cells in

Boyden Chamber assays as described in Pilkington et al., Anticancer Res., 17: 4107-9

(1997), and angiogenesis assays such as induction of vascularization of the chick

chorioallantoic membrane or induction of vascular endothelial cell migration as described

in Ribatta et al., Intl. J. Dev. Biol., 40: 1189-97 (1999) and Li et al., Clin. Exp.

5   Metastasis, 17:423-9 (1999), respectively. Suitable tumor cells lines are available, e.g.

from American Type Tissue Culture Collection catalogs.

4.10.12   RECEPTOR/LIGAND ACTIVITY

A polypeptide of the present invention may also demonstrate activity as receptor,

10   receptor ligand or inhibitor or agonist of receptor/ligand interactions. A polynucleotide

of the invention can encode a polypeptide exhibiting such characteristics. Examples of

such receptors and ligands include, without limitation, cytokine receptors and their

ligands, receptor kinases and their ligands, receptor phosphatases and their ligands,

receptors involved in cell-cell interactions and their ligands (including without limitation,

15   cellular adhesion molecules (such as selectins, integrins and their ligands) and

receptor/ligand pairs involved in antigen presentation, antigen recognition and

development of cellular and humoral immune responses. Receptors and ligands are also

useful for screening of potential peptide or small molecule inhibitors of the relevant

receptor/ligand interaction. A protein of the present invention (including, without

20   limitation, fragments of receptors and ligands) may themselves be useful as inhibitors of

receptor/ligand interactions.

The activity of a polypeptide of the invention may, among other means, be

measured by the following methods:

Suitable assays for receptor-ligand activity include without limitation those

25   described in: Current Protocols in Immunology, Ed by J. E. Coligan, A. M. Kruisbeek,

D. H. Margulies, E. M. Shevach, W. Strober, Pub. Greene Publishing Associates and

Wiley- Interscience (Chapter 7.28, Measurement of Cellular Adhesion under static

conditions 7.28.1- 7.28.22), Takai et al., Proc. Natl. Acad. Sci. USA 84:6864-6868, 1987;

Bierer et al., J. Exp. Med. 168:1145-1156, 1988; Rosenstein et al., J. Exp. Med.

30   169:149-160 1989; Stoltenborg et al., J. Immunol. Methods 175:59-68, 1994; Stitt et al.,

Cell 80:661-670, 1995.

By way of example, the polypeptides of the invention may be used as a receptor for a ligand(s) thereby transmitting the biological activity of that ligand(s). Ligands may be identified through binding assays, affinity chromatography, dihybrid screening assays, BIAcore assays, gel overlay assays, or other methods known in the art.

5   Studies characterizing drugs or proteins as agonist or antagonist or partial agonists or a partial antagonist require the use of other proteins as competing ligands. The polypeptides of the present invention or ligand(s) thereof may be labeled by being coupled to radioisotopes, colorimetric molecules or a toxin molecules by conventional methods. ("Guide to Protein Purification" Murray P. Deutscher (ed) Methods in

10   Enzymology Vol. 182 (1990) Academic Press, Inc. San Diego). Examples of radioisotopes include, but are not limited to, tritium and carbon-14 . Examples of colorimetric molecules include, but are not limited to, fluorescent molecules such as fluorescamine, or rhodamine or other colorimetric molecules. Examples of toxins include, but are not limited, to ricin.

15

4.10.13   DRUG SCREENING

This invention is particularly useful for screening chemical compounds by using the novel polypeptides or binding fragments thereof in any of a variety of drug screening techniques. The polypeptides or fragments employed in such a test may either be free in

20   solution, affixed to a solid support, borne on a cell surface or located intracellularly. One method of drug screening utilizes eukaryotic or prokaryotic host cells which are stably transformed with recombinant nucleic acids expressing the polypeptide or a fragment thereof. Drugs are screened against such transformed cells in competitive binding assays. Such cells, either in viable or fixed form, can be used for standard binding assays. One

25   may measure, for example, the formation of complexes between polypeptides of the invention or fragments and the agent being tested or examine the diminution in complex formation between the novel polypeptides and an appropriate cell line, which are well known in the art.

Sources for test compounds that may be screened for ability to bind to or

30   modulate (i.e., increase or decrease) the activity of polypeptides of the invention include (1) inorganic and organic chemical libraries, (2) natural product libraries, and (3)

combinatorial libraries comprised of either random or mimetic peptides, oligonucleotides or organic molecules.

Chemical libraries may be readily synthesized or purchased from a number of commercial sources, and may include structural analogs of known compounds or

5   compounds that are identified as "hits" or "leads" via natural product screening.

The sources of natural product libraries are microorganisms (including bacteria and fungi), animals, plants or other vegetation, or marine organisms, and libraries of mixtures for screening may be created by: (1) fermentation and extraction of broths from soil, plant or marine microorganisms or (2) extraction of the organisms themselves.

10   Natural product libraries include polyketides, non-ribosomal peptides, and (non-naturally occurring) variants thereof. For a review, see *Science 282*:63-68 (1998).

Combinatorial libraries are composed of large numbers of peptides, oligonucleotides or organic compounds and can be readily prepared by traditional automated synthesis methods, PCR, cloning or proprietary synthetic methods. Of

15   particular interest are peptide and oligonucleotide combinatorial libraries. Still other libraries of interest include peptide, protein, peptidomimetic, multiparallel synthetic collection, recombinatorial, and polypeptide libraries. For a review of combinatorial chemistry and libraries created therefrom, see Myers, *Curr. Opin. Biotechnol.* 8:701-707 (1997). For reviews and examples of peptidomimetic libraries, see Al-Obeidi et al., *Mol.*

20   *Biotechnol,* 9(3):205-23 (1998); Hruby et al., *Curr Opin Chem Biol,* 1(1):114-19 (1997); Dorner et al., *Bioorg Med Chem,* 4(5):709-15 (1996) (alkylated dipeptides).

Identification of modulators through use of the various libraries described herein permits modification of the candidate "hit" (or "lead") to optimize the capacity of the "hit" to bind a polypeptide of the invention. The molecules identified in the binding assay

25   are then tested for antagonist or agonist activity in *in vivo* tissue culture or animal models that are well known in the art. In brief, the molecules are titrated into a plurality of cell cultures or animals and then tested for either cell/animal death or prolonged survival of the animal/cells.

The binding molecules thus identified may be complexed with toxins, e.g., ricin

30   or cholera, or with other compounds that are toxic to cells such as radioisotopes. The toxin-binding molecule complex is then targeted to a tumor or other cell by the specificity

of the binding molecule for a polypeptide of the invention. Alternatively, the binding molecules may be complexed with imaging agents for targeting and imaging purposes.

4.10.14   ASSAY FOR RECEPTOR ACTIVITY

5   The invention also provides methods to detect specific binding of a polypeptide e.g. a ligand or a receptor. The art provides numerous assays particularly useful for identifying previously unknown binding partners for receptor polypeptides of the invention. For example, expression cloning using mammalian or bacterial cells, or dihybrid screening assays can be used to identify polynucleotides encoding binding

10   partners. As another example, affinity chromatography with the appropriate immobilized polypeptide of the invention can be used to isolate polypeptides that recognize and bind polypeptides of the invention. There are a number of different libraries used for the identification of compounds, and in particular small molecules, that modulate (*i.e.*, increase or decrease) biological activity of a polypeptide of the invention. Ligands for

15   receptor polypeptides of the invention can also be identified by adding exogenous ligands, or cocktails of ligands to two cells populations that are genetically identical except for the expression of the receptor of the invention: one cell population expresses the receptor of the invention whereas the other does not. The response of the two cell populations to the addition of ligands(s) are then compared. Alternatively, an expression

20   library can be co-expressed with the polypeptide of the invention in cells and assayed for an autocrine response to identify potential ligand(s). As still another example, BIAcore assays, gel overlay assays, or other methods known in the art can be used to identify binding partner polypeptides, including, (1) organic and inorganic chemical libraries, (2) natural product libraries, and (3) combinatorial libraries comprised of random peptides,

25   oligonucleotides or organic molecules.

        The role of downstream intracellular signaling molecules in the signaling cascade of the polypeptide of the invention can be determined. For example, a chimeric protein in which the cytoplasmic domain of the polypeptide of the invention is fused to the extracellular portion of a protein, whose ligand has been identified, is produced in a host

30   cell. The cell is then incubated with the ligand specific for the extracellular portion of the chimeric protein, thereby activating the chimeric receptor. Known downstream proteins

involved in intracellular signaling can then be assayed for expected modifications i.e. phosphorylation. Other methods known to those in the art can also be used to identify signaling molecules involved in receptor activity.

5   **4.10.15   ANTI-INFLAMMATORY ACTIVITY**

Compositions of the present invention may also exhibit anti-inflammatory activity. The anti-inflammatory activity may be achieved by providing a stimulus to cells involved in the inflammatory response, by inhibiting or promoting cell-cell interactions (such as, for example, cell adhesion), by inhibiting or promoting chemotaxis of cells

10   involved in the inflammatory process, inhibiting or promoting cell extravasation, or by stimulating or suppressing production of other factors which more directly inhibit or promote an inflammatory response. Compositions with such activities can be used to treat inflammatory conditions including chronic or acute conditions), including without limitation intimation associated with infection (such as septic shock, sepsis or systemic

15   inflammatory response syndrome (SIRS)), ischemia-reperfusion injury, endotoxin lethality, arthritis, complement-mediated hyperacute rejection, nephritis, cytokine or chemokine-induced lung injury, inflammatory bowel disease, Crohn's disease or resulting from over production of cytokines such as TNF or IL-1. Compositions of the invention may also be useful to treat anaphylaxis and hypersensitivity to an antigenic substance or

20   material. Compositions of this invention may be utilized to prevent or treat conditions such as, but not limited to, sepsis, acute pancreatitis, endotoxin shock, cytokine induced shock, rheumatoid arthritis, chronic inflammatory arthritis, pancreatic cell damage from diabetes mellitus type 1, graft versus host disease, inflammatory bowel disease, inflamation associated with pulmonary disease, other autoimmune disease or

25   inflammatory disease, an antiproliferative agent such as for acute or chronic mylegenous leukemia or in the prevention of premature labor secondary to intrauterine infections.

4.10.16   LEUKEMIAS

Leukemias and related disorders may be treated or prevented by administration of

30   a therapeutic that promotes or inhibits function of the polynucleotides and/or polypeptides of the invention. Such leukemias and related disorders include but are not

limited to acute leukemia, acute lymphocytic leukemia, acute myelocytic leukemia, myeloblastic, promyelocytic, myelomonocytic, monocytic, erythroleukemia, chronic leukemia, chronic myelocytic (granulocytic) leukemia and chronic lymphocytic leukemia (for a review of such disorders, see Fishman et al., 1985, Medicine, 2d Ed., J.B.

5   Lippincott Co., Philadelphia).

4.10.17   NERVOUS SYSTEM DISORDERS

Nervous system disorders, involving cell types which can be tested for efficacy of intervention with compounds that modulate the activity of the polynucleotides and/or

10   polypeptides of the invention, and which can be treated upon thus observing an indication of therapeutic utility, include but are not limited to nervous system injuries, and diseases or disorders which result in either a disconnection of axons, a diminution or degeneration of neurons, or demyelination. Nervous system lesions which may be treated in a patient (including human and non-human mammalian patients) according to the invention

15   include but are not limited to the following lesions of either the central (including spinal cord, brain) or peripheral nervous systems:

(i)   traumatic lesions, including lesions caused by physical injury or associated with surgery, for example, lesions which sever a portion of the nervous system, or compression injuries;

20   (ii)   ischemic lesions, in which a lack of oxygen in a portion of the nervous system results in neuronal injury or death, including cerebral infarction or ischemia, or spinal cord infarction or ischemia;

(iii)   infectious lesions, in which a portion of the nervous system is destroyed or injured as a result of infection, for example, by an abscess or associated with infection by

25   human immunodeficiency virus, herpes zoster, or herpes simplex virus or with Lyme disease, tuberculosis, syphilis;

(iv)   degenerative lesions, in which a portion of the nervous system is destroyed or injured as a result of a degenerative process including but not limited to degeneration associated with Parkinson's disease, Alzheimer's disease, Huntington's chorea, or

30   amyotrophic lateral sclerosis;

(v)   lesions associated with nutritional diseases or disorders, in which a portion

of the nervous system is destroyed or injured by a nutritional disorder or disorder of

metabolism including but not limited to, vitamin B12 deficiency, folic acid deficiency,

Wernicke disease, tobacco-alcohol amblyopia, Marchiafava-Bignami disease (primary

5   degeneration of the corpus callosum), and alcoholic cerebellar degeneration;

(vi)   neurological lesions associated with systemic diseases including but not

limited to diabetes (diabetic neuropathy, Bell's palsy), systemic lupus erythematosus,

carcinoma, or sarcoidosis;

(vii)   lesions caused by toxic substances including alcohol, lead, or particular

10   neurotoxins; and

(viii) demyelinated lesions in which a portion of the nervous system is

destroyed or injured by a demyelinating disease including but not limited to multiple

sclerosis, human immunodeficiency virus-associated myelopathy, transverse myelopathy

or various etiologies, progressive multifocal leukoencephalopathy, and central pontine

15   myelinolysis.

Therapeutics which are useful according to the invention for treatment of a

nervous system disorder may be selected by testing for biological activity in promoting

the survival or differentiation of neurons. For example, and not by way of limitation,

therapeutics which elicit any of the following effects may be useful according to the

20   invention:

(i)   increased survival time of neurons in culture;

(ii)   increased sprouting of neurons in culture or in vivo;

(iii)   increased production of a neuron-associated molecule in culture or *in vivo*,

e.g., choline acetyltransferase or acetylcholinesterase with respect to motor neurons; or

25   (iv)   decreased symptoms of neuron dysfunction in vivo.

Such effects may be measured by any method known in the art. In preferred,

non-limiting embodiments, increased survival of neurons may be measured by the

method set forth in Arakawa et al. (1990, J. Neurosci. 10:3507-3515); increased sprouting

of neurons may be detected by methods set forth in Pestronk et al. (1980, Exp. Neurol.

30   70:65-82) or Brown et al. (1981, Ann. Rev. Neurosci. 4:17-42); increased production of

neuron-associated molecules may be measured by bioassay, enzymatic assay, antibody

binding, Northern blot assay, *etc.*, depending on the molecule to be measured; and motor neuron dysfunction may be measured by assessing the physical manifestation of motor neuron disorder, *e.g.*, weakness, motor neuron conduction velocity, or functional disability.

5   In specific embodiments, motor neuron disorders that may be treated according to the invention include but are not limited to disorders such as infarction, infection, exposure to toxin, trauma, surgical damage, degenerative disease or malignancy that may affect motor neurons as well as other components of the nervous system, as well as disorders that selectively affect neurons such as amyotrophic lateral sclerosis, and

10   including but not limited to progressive spinal muscular atrophy, progressive bulbar palsy, primary lateral sclerosis, infantile and juvenile muscular atrophy, progressive bulbar paralysis of childhood (Fazio-Londe syndrome), poliomyelitis and the post polio syndrome, and Hereditary Motorsensory Neuropathy (Charcot-Marie-Tooth Disease).

15   **4.10.18   OTHER ACTIVITIES**

A polypeptide of the invention may also exhibit one or more of the following additional activities or effects: inhibiting the growth, infection or function of, or killing, infectious agents, including, without limitation, bacteria, viruses, fungi and other parasites; effecting (suppressing or enhancing) bodily characteristics, including, without

20   limitation, height, weight, hair color, eye color, skin, fat to lean ratio or other tissue pigmentation, or organ or body part size or shape (such as, for example, breast augmentation or diminution, change in bone form or shape); effecting biorhythms or circadian cycles or rhythms; effecting the fertility of male or female subjects; effecting the metabolism, catabolism, anabolism, processing, utilization, storage or elimination of

25   dietary fat, lipid, protein, carbohydrate, vitamins, minerals, co-factors or other nutritional factors or component(s); effecting behavioral characteristics, including, without limitation, appetite, libido, stress, cognition (including cognitive disorders), depression (including depressive disorders) and violent behaviors; providing analgesic effects or other pain reducing effects; promoting differentiation and growth of embryonic stem cells

30   in lineages other than hematopoietic lineages; hormonal or endocrine activity; in the case of enzymes, correcting deficiencies of the enzyme and treating deficiency-related

diseases; treatment of hyperproliferative disorders (such as, for example, psoriasis); immunoglobulin-like activity (such as, for example, the ability to bind antigens or complement); and the ability to act as an antigen in a vaccine composition to raise an immune response against such protein or another material or entity which is

5   cross-reactive with such protein.

4.10.19   IDENTIFICATION OF POLYMORPHISMS

The demonstration of polymorphisms makes possible the identification of such polymorphisms in human subjects and the pharmacogenetic use of this information for

10   diagnosis and treatment. Such polymorphisms may be associated with, e.g., differential predisposition or susceptibility to various disease states (such as disorders involving inflammation or immune response) or a differential response to drug administration, and this genetic information can be used to tailor preventive or therapeutic treatment appropriately. For example, the existence of a polymorphism associated with a

15   predisposition to inflammation or autoimmune disease makes possible the diagnosis of this condition in humans by identifying the presence of the polymorphism.

Polymorphisms can be identified in a variety of ways known in the art which all generally involve obtaining a sample from a patient, analyzing DNA from the sample, optionally involving isolation or amplification of the DNA, and identifying the presence

20   of the polymorphism in the DNA. For example, PCR may be used to amplify an appropriate fragment of genomic DNA which may then be sequenced. Alternatively, the DNA may be subjected to allele-specific oligonucleotide hybridization (in which appropriate oligonucleotides are hybridized to the DNA under conditions permitting detection of a single base mismatch) or to a single nucleotide extension assay (in which

25   an oligonucleotide that hybridizes immediately adjacent to the position of the polymorphism is extended with one or more labeled nucleotides). In addition, traditional restriction fragment length polymorphism analysis (using restriction enzymes that provide differential digestion of the genomic DNA depending on the presence or absence of the polymorphism) may be performed. Arrays with nucleotide sequences of the

30   present invention can be used to detect polymorphisms. The array can comprise modified nucleotide sequences of the present invention in order to detect the nucleotide sequences

of the present invention. In the alternative, any one of the nucleotide sequences of the present invention can be placed on the array to detect changes from those sequences.

Alternatively a polymorphism resulting in a change in the amino acid sequence could also be detected by detecting a corresponding change in amino acid sequence of the

5   protein, e.g., by an antibody specific to the variant sequence.

4.10.20   ARTHRITIS AND INFLAMMATION

The immunosuppressive effects of the compositions of the invention against rheumatoid arthritis is determined in an experimental animal model system. The

10   experimental model system is adjuvant induced arthritis in rats, and the protocol is described by J. Holoshitz, et at., 1983, Science, 219:56, or by B. Waksman et al., 1963, Int. Arch. Allergy Appl. Immunol., 23:129. Induction of the disease can be caused by a single injection, generally intradermally, of a suspension of killed Mycobacterium tuberculosis in complete Freund's adjuvant (CFA). The route of injection can vary, but

15   rats may be injected at the base of the tail with an adjuvant mixture. The polypeptide is administered in phosphate buffered solution (PBS) at a dose of about 1-5 mg/kg. The control consists of administering PBS only.

The procedure for testing the effects of the test compound would consist of intradermally injecting killed Mycobacterium tuberculosis in CFA followed by

20   immediately administering the test compound and subsequent treatment every other day until day 24. At 14, 15, 18, 20, 22, and 24 days after injection of Mycobacterium CFA, an overall arthritis score may be obtained as described by J. Holoskitz above. An analysis of the data would reveal that the test compound would have a dramatic affect on the swelling of the joints as measured by a decrease of the arthritis score.

25

4.11 THERAPEUTIC METHODS

The compositions (including polypeptide fragments, analogs, variants and antibodies or other binding partners or modulators including antisense polynucleotides) of the invention have numerous applications in a variety of therapeutic methods.

30   Examples of therapeutic applications include, but are not limited to, those exemplified herein.

4.11.1 EXAMPLE

One embodiment of the invention is the administration of an effective amount of the polypeptides or other composition of the invention to individuals affected by a

5   disease or disorder that can be modulated by regulating the peptides of the invention. While the mode of administration is not particularly important, parenteral administration is preferred. An exemplary mode of administration is to deliver an intravenous bolus. The dosage of the polypeptides or other composition of the invention will normally be determined by the prescribing physician. It is to be expected that the dosage will vary

10   according to the age, weight, condition and response of the individual patient. Typically, the amount of polypeptide administered per dose will be in the range of about $0.01 \mu g/kg$ to 100 mg/kg of body weight, with the preferred dose being about $0.1 \mu g/kg$ to 10 mg/kg of patient body weight. For parenteral administration, polypeptides of the invention will be formulated in an injectable form combined with a pharmaceutically acceptable

15   parenteral vehicle. Such vehicles are well known in the art and examples include water, saline, Ringer's solution, dextrose solution, and solutions consisting of small amounts of the human serum albumin. The vehicle may contain minor amounts of additives that maintain the isotonicity and stability of the polypeptide or other active ingredient. The preparation of such solutions is within the skill of the art.

20

4.12   PHARMACEUTICAL FORMULATIONS AND ROUTES OF ADMINISTRATION

A protein or other composition of the present invention (from whatever source derived, including without limitation from recombinant and non-recombinant sources and

25   including antibodies and other binding partners of the polypeptides of the invention) may be administered to a patient in need, by itself, or in pharmaceutical compositions where it is mixed with suitable carriers or excipient(s) at doses to treat or ameliorate a variety of disorders. Such a composition may optionally contain (in addition to protein or other active ingredient and a carrier) diluents, fillers, salts, buffers, stabilizers, solubilizers, and

30   other materials well known in the art. The term "pharmaceutically acceptable" means a non-toxic material that does not interfere with the effectiveness of the biological activity

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of the active ingredient(s). The characteristics of the carrier will depend on the route of administration. The pharmaceutical composition of the invention may also contain cytokines, lymphokines, or other hematopoietic factors such as M-CSF, GM-CSF, TNF, IL-1, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12, IL-13, IL-14,

5   IL-15, IFN, TNF0, TNF1, TNF2, G-CSF, Meg-CSF, thrombopoietin, stem cell factor, and erythropoietin. In further compositions, proteins of the invention may be combined with other agents beneficial to the treatment of the disease or disorder in question. These agents include various growth factors such as epidermal growth factor (EGF), platelet-derived growth factor (PDGF), transforming growth factors (TGF-α and TGF-β),

10   insulin-like growth factor (IGF), as well as cytokines described herein.

The pharmaceutical composition may further contain other agents which either enhance the activity of the protein or other active ingredient or complement its activity or use in treatment. Such additional factors and/or agents may be included in the pharmaceutical composition to produce a synergistic effect with protein or other active

15   ingredient of the invention, or to minimize side effects. Conversely, protein or other active ingredient of the present invention may be included in formulations of the particular clotting factor, cytokine, lymphokine, other hematopoietic factor, thrombolytic or anti-thrombotic factor, or anti- inflammatory agent to minimize side effects of the clotting factor, cytokine, lymphokine, other hematopoietic factor, thrombolytic or

20   anti-thrombotic factor, or anti-inflammatory agent (such as IL-1Ra, IL-1 Hy1, IL-1 Hy2, anti-TNF, corticosteroids, immunosuppressive agents). A protein of the present invention may be active in multimers (e.g., heterodimers or homodimers) or complexes with itself or other proteins. As a result, pharmaceutical compositions of the invention may comprise a protein of the invention in such multimeric or complexed form.

25   As an alternative to being included in a pharmaceutical composition of the invention including a first protein, a second protein or a therapeutic agent may be concurrently administered with the first protein (e.g., at the same time, or at differing times provided that therapeutic concentrations of the combination of agents is achieved at the treatment site). Techniques for formulation and administration of the compounds of

30   the instant application may be found in "Remington's Pharmaceutical Sciences," Mack Publishing Co., Easton, PA, latest edition. A therapeutically effective dose further refers

to that amount of the compound sufficient to result in amelioration of symptoms, *e.g.*, treatment, healing, prevention or amelioration of the relevant medical condition, or an increase in rate of treatment, healing, prevention or amelioration of such conditions. When applied to an individual active ingredient, administered alone, a therapeutically

5   effective dose refers to that ingredient alone. When applied to a combination, a therapeutically effective dose refers to combined amounts of the active ingredients that result in the therapeutic effect, whether administered in combination, serially or simultaneously.

In practicing the method of treatment or use of the present invention, a

10   therapeutically effective amount of protein or other active ingredient of the present invention is administered to a mammal having a condition to be treated. Protein or other active ingredient of the present invention may be administered in accordance with the method of the invention either alone or in combination with other therapies such as treatments employing cytokines, lymphokines or other hematopoietic factors. When co-

15   administered with one or more cytokines, lymphokines or other hematopoietic factors, protein or other active ingredient of the present invention may be administered either simultaneously with the cytokine(s), lymphokine(s), other hematopoietic factor(s), thrombolytic or anti-thrombotic factors, or sequentially. If administered sequentially, the attending physician will decide on the appropriate sequence of administering protein or

20   other active ingredient of the present invention in combination with cytokine(s), lymphokine(s), other hematopoietic factor(s), thrombolytic or anti-thrombotic factors.

4.12.1 ROUTES OF ADMINISTRATION

Suitable routes of administration may, for example, include oral, rectal,

25   transmucosal, or intestinal administration; parenteral delivery, including intramuscular, subcutaneous, intramedullary injections, as well as intrathecal, direct intraventricular, intravenous, intraperitoneal, intranasal, or intraocular injections. Administration of protein or other active ingredient of the present invention used in the pharmaceutical composition or to practice the method of the present invention can be carried out in a

30   variety of conventional ways, such as oral ingestion, inhalation, topical application or

cutaneous, subcutaneous, intraperitoneal, parenteral or intravenous injection. Intravenous administration to the patient is preferred.

Alternately, one may administer the compound in a local rather than systemic manner, for example, via injection of the compound directly into a arthritic joints or in

5   fibrotic tissue, often in a depot or sustained release formulation. In order to prevent the scarring process frequently occurring as complication of glaucoma surgery, the compounds may be administered topically, for example, as eye drops. Furthermore, one may administer the drug in a targeted drug delivery system, for example, in a liposome coated with a specific antibody, targeting, for example, arthritic or fibrotic tissue. The

10 liposomes will be targeted to and taken up selectively by the afflicted tissue.

The polypeptides of the invention are administered by any route that delivers an effective dosage to the desired site of action. The determination of a suitable route of administration and an effective dosage for a particular indication is within the level of skill in the art. Preferably for wound treatment, one administers the therapeutic

15 compound directly to the site. Suitable dosage ranges for the polypeptides of the invention can be extrapolated from these dosages or from similar studies in appropriate animal models. Dosages can then be adjusted as necessary by the clinician to provide maximal therapeutic benefit.

20   **4.12.2 COMPOSITIONS/FORMULATIONS**

Pharmaceutical compositions for use in accordance with the present invention thus may be formulated in a conventional manner using one or more physiologically acceptable carriers comprising excipients and auxiliaries which facilitate processing of the active compounds into preparations which can be used pharmaceutically. These

25 pharmaceutical compositions may be manufactured in a manner that is itself known, *e.g.*, by means of conventional mixing, dissolving, granulating, dragee-making, levigating, emulsifying, encapsulating, entrapping or lyophilizing processes. Proper formulation is dependent upon the route of administration chosen. When a therapeutically effective amount of protein or other active ingredient of the present invention is administered

30 orally, protein or other active ingredient of the present invention will be in the form of a tablet, capsule, powder, solution or elixir. When administered in tablet form, the

pharmaceutical composition of the invention may additionally contain a solid carrier such as a gelatin or an adjuvant. The tablet, capsule, and powder contain from about 5 to 95% protein or other active ingredient of the present invention, and preferably from about 25 to 90% protein or other active ingredient of the present invention. When administered in

5   liquid form, a liquid carrier such as water, petroleum, oils of animal or plant origin such as peanut oil, mineral oil, soybean oil, or sesame oil, or synthetic oils may be added. The liquid form of the pharmaceutical composition may further contain physiological saline solution, dextrose or other saccharide solution, or glycols such as ethylene glycol, propylene glycol or polyethylene glycol. When administered in liquid form, the

10   pharmaceutical composition contains from about 0.5 to 90% by weight of protein or other active ingredient of the present invention, and preferably from about 1 to 50% protein or other active ingredient of the present invention.

When a therapeutically effective amount of protein or other active ingredient of the present invention is administered by intravenous, cutaneous or subcutaneous

15   injection, protein or other active ingredient of the present invention will be in the form of a pyrogen-free, parenterally acceptable aqueous solution. The preparation of such parenterally acceptable protein or other active ingredient solutions, having due regard to pH, isotonicity, stability, and the like, is within the skill in the art. A preferred pharmaceutical composition for intravenous, cutaneous, or subcutaneous injection should

20   contain, in addition to protein or other active ingredient of the present invention, an isotonic vehicle such as Sodium Chloride Injection, Ringer's Injection, Dextrose Injection, Dextrose and Sodium Chloride Injection, Lactated Ringer's Injection, or other vehicle as known in the art. The pharmaceutical composition of the present invention may also contain stabilizers, preservatives, buffers, antioxidants, or other additives

25   known to those of skill in the art. For injection, the agents of the invention may be formulated in aqueous solutions, preferably in physiologically compatible buffers such as Hanks's solution, Ringer's solution, or physiological saline buffer. For transmucosal administration, penetrants appropriate to the barrier to be permeated are used in the formulation. Such penetrants are generally known in the art.

30   For oral administration, the compounds can be formulated readily by combining the active compounds with pharmaceutically acceptable carriers well known in the art.

Such carriers enable the compounds of the invention to be formulated as tablets, pills, dragees, capsules, liquids, gels, syrups, slurries, suspensions and the like, for oral ingestion by a patient to be treated. Pharmaceutical preparations for oral use can be obtained from a solid excipient, optionally grinding a resulting mixture, and processing

5   the mixture of granules, after adding suitable auxiliaries, if desired, to obtain tablets or dragee cores. Suitable excipients are, in particular, fillers such as sugars, including lactose, sucrose, mannitol, or sorbitol; cellulose preparations such as, for example, maize starch, wheat starch, rice starch, potato starch, gelatin, gum tragacanth, methyl cellulose, hydroxypropylmethyl-cellulose, sodium carboxymethylcellulose, and/or

10 polyvinylpyrrolidone (PVP). If desired, disintegrating agents may be added, such as the cross-linked polyvinyl pyrrolidone, agar, or alginic acid or a salt thereof such as sodium alginate. Dragee cores are provided with suitable coatings. For this purpose, concentrated sugar solutions may be used, which may optionally contain gum arabic, talc, polyvinyl pyrrolidone, carbopol gel, polyethylene glycol, and/or titanium dioxide, lacquer

15 solutions, and suitable organic solvents or solvent mixtures. Dyestuffs or pigments may be added to the tablets or dragee coatings for identification or to characterize different combinations of active compound doses.

Pharmaceutical preparations which can be used orally include push-fit capsules made of gelatin, as well as soft, sealed capsules made of gelatin and a plasticizer, such as

20 glycerol or sorbitol. The push-fit capsules can contain the active ingredients in admixture with filler such as lactose, binders such as starches, and/or lubricants such as talc or magnesium stearate and, optionally, stabilizers. In soft capsules, the active compounds may be dissolved or suspended in suitable liquids, such as fatty oils, liquid paraffin, or liquid polyethylene glycols. In addition, stabilizers may be added. All formulations for

25 oral administration should be in dosages suitable for such administration. For buccal administration, the compositions may take the form of tablets or lozenges formulated in conventional manner.

For administration by inhalation, the compounds for use according to the present invention are conveniently delivered in the form of an aerosol spray presentation from

30 pressurized packs or a nebuliser, with the use of a suitable propellant, e.g., dichlorodifluoromethane, trichlorofluoromethane, dichlorotetrafluoroethane, carbon

dioxide or other suitable gas. In the case of a pressurized aerosol the dosage unit may be determined by providing a valve to deliver a metered amount. Capsules and cartridges of, *e.g.*, gelatin for use in an inhaler or insufflator may be formulated containing a powder mix of the compound and a suitable powder base such as lactose or starch. The

5   compounds may be formulated for parenteral administration by injection, *e.g.*, by bolus injection or continuous infusion. Formulations for injection may be presented in unit dosage form, *e.g.*, in ampules or in multi-dose containers, with an added preservative. The compositions may take such forms as suspensions, solutions or emulsions in oily or aqueous vehicles, and may contain formulatory agents such as suspending, stabilizing

10   and/or dispersing agents.

Pharmaceutical formulations for parenteral administration include aqueous solutions of the active compounds in water-soluble form. Additionally, suspensions of the active compounds may be prepared as appropriate oily injection suspensions. Suitable lipophilic solvents or vehicles include fatty oils such as sesame oil, or synthetic

15   fatty acid esters, such as ethyl oleate or triglycerides, or liposomes. Aqueous injection suspensions may contain substances which increase the viscosity of the suspension, such as sodium carboxymethyl cellulose, sorbitol, or dextran. Optionally, the suspension may also contain suitable stabilizers or agents which increase the solubility of the compounds to allow for the preparation of highly concentrated solutions. Alternatively, the active

20   ingredient may be in powder form for constitution with a suitable vehicle, *e.g.*, sterile pyrogen-free water, before use.

The compounds may also be formulated in rectal compositions such as suppositories or retention enemas, *e.g.*, containing conventional suppository bases such as cocoa butter or other glycerides. In addition to the formulations described previously, the

25   compounds may also be formulated as a depot preparation. Such long acting formulations may be administered by implantation (for example subcutaneously or intramuscularly) or by intramuscular injection. Thus, for example, the compounds may be formulated with suitable polymeric or hydrophobic materials (for example as an emulsion in an acceptable oil) or ion exchange resins, or as sparingly soluble derivatives,

30   for example, as a sparingly soluble salt.

A pharmaceutical carrier for the hydrophobic compounds of the invention is a co-solvent system comprising benzyl alcohol, a nonpolar surfactant, a water-miscible organic polymer, and an aqueous phase. The co-solvent system may be the VPD co-solvent system. VPD is a solution of 3% w/v benzyl alcohol, 8% w/v of the nonpolar

5   surfactant polysorbate 80, and 65% w/v polyethylene glycol 300, made up to volume in absolute ethanol. The VPD co-solvent system (VPD:5W) consists of VPD diluted 1:1 with a 5% dextrose in water solution. This co-solvent system dissolves hydrophobic compounds well, and itself produces low toxicity upon systemic administration. Naturally, the proportions of a co-solvent system may be varied considerably without

10   destroying its solubility and toxicity characteristics. Furthermore, the identity of the co-solvent components may be varied: for example, other low-toxicity nonpolar. surfactants may be used instead of polysorbate 80; the fraction size of polyethylene glycol may be varied; other biocompatible polymers may replace polyethylene glycol, e.g. polyvinyl pyrrolidone; and other sugars or polysaccharides may substitute for

15   dextrose. Alternatively, other delivery systems for hydrophobic pharmaceutical compounds may be employed. Liposomes and emulsions are well known examples of delivery vehicles or carriers for hydrophobic drugs. Certain organic solvents such as dimethylsulfoxide also may be employed, although usually at the cost of greater toxicity. Additionally, the compounds may be delivered using a sustained-release system, such as

20   semipermeable matrices of solid hydrophobic polymers containing the therapeutic agent. Various types of sustained-release materials have been established and are well known by those skilled in the art. Sustained-release capsules may, depending on their chemical nature, release the compounds for a few weeks up to over 100 days. Depending on the chemical nature and the biological stability of the therapeutic reagent, additional

25   strategies for protein or other active ingredient stabilization may be employed.

The pharmaceutical compositions also may comprise suitable solid or gel phase carriers or excipients. Examples of such carriers or excipients include but are not limited to calcium carbonate, calcium phosphate, various sugars, starches, cellulose derivatives, gelatin, and polymers such as polyethylene glycols. Many of the active ingredients of the

30   invention may be provided as salts with pharmaceutically compatible counter ions. Such pharmaceutically acceptable base addition salts are those salts which retain the biological

effectiveness and properties of the free acids and which are obtained by reaction with
inorganic or organic bases such as sodium hydroxide, magnesium hydroxide, ammonia,
trialkylamine, dialkylamine, monoalkylamine, dibasic amino acids, sodium acetate,
potassium benzoate, triethanol amine and the like.

5   The pharmaceutical composition of the invention may be in the form of a
complex of the protein(s) or other active ingredient(s) of present invention along with
protein or peptide antigens. The protein and/or peptide antigen will deliver a stimulatory
signal to both B and T lymphocytes. B lymphocytes will respond to antigen through their
surface immunoglobulin receptor. T lymphocytes will respond to antigen through the T
10   cell receptor (TCR) following presentation of the antigen by MHC proteins. MHC and
structurally related proteins including those encoded by class I and class II MHC genes
on host cells will serve to present the peptide antigen(s) to T lymphocytes. The antigen
components could also be supplied as purified MHC-peptide complexes alone or with
co-stimulatory molecules that can directly signal T cells. Alternatively antibodies able to
15   bind surface immunoglobulin and other molecules on B cells as well as antibodies able to
bind the TCR and other molecules on T cells can be combined with the pharmaceutical
composition of the invention.

        The pharmaceutical composition of the invention may be in the form of a
liposome in which protein of the present invention is combined, in addition to other
20   pharmaceutically acceptable carriers, with amphipathic agents such as lipids which exist
in aggregated form as micelles, insoluble monolayers, liquid crystals, or lamellar layers
in aqueous solution. Suitable lipids for liposomal formulation include, without limitation,
monoglycerides, diglycerides, sulfatides, lysolecithins, phospholipids, saponin, bile acids,
and the like. Preparation of such liposomal formulations is within the level of skill in the
25   art, as disclosed, for example, in U.S. Patent Nos. 4,235,871; 4,501,728; 4,837,028; and
4,737,323, all of which are incorporated herein by reference.

        The amount of protein or other active ingredient of the present invention in the
pharmaceutical composition of the present invention will depend upon the nature and
severity of the condition being treated, and on the nature of prior treatments which the
30   patient has undergone. Ultimately, the attending physician will decide the amount of
protein or other active ingredient of the present invention with which to treat each

individual patient. Initially, the attending physician will administer low doses of protein or other active ingredient of the present invention and observe the patient's response. Larger doses of protein or other active ingredient of the present invention may be administered until the optimal therapeutic effect is obtained for the patient, and at that

5   point the dosage is not increased further. It is contemplated that the various pharmaceutical compositions used to practice the method of the present invention should contain about 0.01 µg to about 100 mg (preferably about 0.1 µg to about 10 mg, more preferably about 0.1 µg to about 1 mg) of protein or other active ingredient of the present invention per kg body weight. For compositions of the present invention which are

10   useful for bone, cartilage, tendon or ligament regeneration, the therapeutic method includes administering the composition topically, systematically, or locally as an implant or device. When administered, the therapeutic composition for use in this invention is, of course, in a pyrogen-free, physiologically acceptable form. Further, the composition may desirably be encapsulated or injected in a viscous form for delivery to the site of bone,

15   cartilage or tissue damage. Topical administration may be suitable for wound healing and tissue repair. Therapeutically useful agents other than a protein or other active ingredient of the invention which may also optionally be included in the composition as described above, may alternatively or additionally, be administered simultaneously or sequentially with the composition in the methods of the invention. Preferably for bone

20   and/or cartilage formation, the composition would include a matrix capable of delivering the protein-containing or other active ingredient-containing composition to the site of bone and/or cartilage damage, providing a structure for the developing bone and cartilage and optimally capable of being resorbed into the body. Such matrices may be formed of materials presently in use for other implanted medical applications.

25   The choice of matrix material is based on biocompatibility, biodegradability, mechanical properties, cosmetic appearance and interface properties. The particular application of the compositions will define the appropriate formulation. Potential matrices for the compositions may be biodegradable and chemically defined calcium sulfate, tricalcium phosphate, hydroxyapatite, polylactic acid, polyglycolic acid and

30   polyanhydrides. Other potential materials are biodegradable and biologically well-defined, such as bone or dermal collagen. Further matrices are comprised of pure

proteins or extracellular matrix components. Other potential matrices are
nonbiodegradable and chemically defined, such as sintered hydroxyapatite, bioglass,
aluminates, or other ceramics. Matrices may be comprised of combinations of any of the
above mentioned types of material, such as polylactic acid and hydroxyapatite or

5   collagen and tricalcium phosphate. The bioceramics may be altered in composition, such
as in calcium-aluminate-phosphate and processing to alter pore size, particle size, particle
shape, and biodegradability. Presently preferred is a 50:50 (mole weight) copolymer of
lactic acid and glycolic acid in the form of porous particles having diameters ranging
from 150 to 800 microns. In some applications, it will be useful to utilize a sequestering

10   agent, such as carboxymethyl cellulose or autologous blood clot, to prevent the protein
compositions from disassociating from the matrix.

        A preferred family of sequestering agents is cellulosic materials such as
alkylcelluloses (including hydroxyalkylcelluloses), including methylcellulose,
ethylcellulose, hydroxyethylcellulose, hydroxypropylcellulose,

15   hydroxypropyl-methylcellulose, and carboxymethylcellulose, the most preferred being
cationic salts of carboxymethylcellulose (CMC). Other preferred sequestering agents
include hyaluronic acid, sodium alginate, poly(ethylene glycol), polyoxyethylene oxide,
carboxyvinyl polymer and poly(vinyl alcohol). The amount of sequestering agent useful
herein is 0.5-20 wt %, preferably 1-10 wt % based on total formulation weight, which

20   represents the amount necessary to prevent desorption of the protein from the polymer
matrix and to provide appropriate handling of the composition, yet not so much that the
progenitor cells are prevented from infiltrating the matrix, thereby providing the protein
the opportunity to assist the osteogenic activity of the progenitor cells. In further
compositions, proteins or other active ingredients of the invention may be combined with

25   other agents beneficial to the treatment of the bone and/or cartilage defect, wound, or
tissue in question. These agents include various growth factors such as epidermal growth
factor (EGF), platelet derived growth factor (PDGF), transforming growth factors
(TGF-α and TGF-β), and insulin-like growth factor (IGF).

        The therapeutic compositions are also presently valuable for veterinary

30   applications. Particularly domestic animals and thoroughbred horses, in addition to
humans, are desired patients for such treatment with proteins or other active ingredients

of the present invention. The dosage regimen of a protein-containing pharmaceutical composition to be used in tissue regeneration will be determined by the attending physician considering various factors which modify the action of the proteins, *e.g.,* amount of tissue weight desired to be formed, the site of damage, the condition of the

5   damaged tissue, the size of a wound, type of damaged tissue (*e.g.,* bone), the patient's age, sex, and diet, the severity of any infection, time of administration and other clinical factors. The dosage may vary with the type of matrix used in the reconstitution and with inclusion of other proteins in the pharmaceutical composition. For example, the addition of other known growth factors, such as IGF I (insulin like growth factor I), to the final

10   composition, may also effect the dosage. Progress can be monitored by periodic assessment of tissue/bone growth and/or repair, for example, X-rays, histomorphometric determinations and tetracycline labeling.

Polynucleotides of the present invention can also be used for gene therapy. Such polynucleotides can be introduced either in vivo or ex vivo into cells for expression in a

15   mammalian subject. Polynucleotides of the invention may also be administered by other known methods for introduction of nucleic acid into a cell or organism (including, without limitation, in the form of viral vectors or naked DNA). Cells may also be cultured ex vivo in the presence of proteins of the present invention in order to proliferate or to produce a desired effect on or activity in such cells. Treated cells can then be

20   introduced in vivo for therapeutic purposes.

4.12.3 EFFECTIVE DOSAGE

Pharmaceutical compositions suitable for use in the present invention include compositions wherein the active ingredients are contained in an effective amount to

25   achieve its intended purpose. More specifically, a therapeutically effective amount means an amount effective to prevent development of or to alleviate the existing symptoms of the subject being treated. Determination of the effective amount is well within the capability of those skilled in the art, especially in light of the detailed disclosure provided herein. For any compound used in the method of the invention, the

30   therapeutically effective dose can be estimated initially from appropriate in vitro assays. For example, a dose can be formulated in animal models to achieve a circulating

concentration range that can be used to more accurately determine useful doses in humans. For example, a dose can be formulated in animal models to achieve a circulating concentration range that includes the IC_{50} as determined in cell culture (*i.e.*, the concentration of the test compound which achieves a half-maximal inhibition of the

5   protein's biological activity). Such information can be used to more accurately determine useful doses in humans.

A therapeutically effective dose refers to that amount of the compound that results in amelioration of symptoms or a prolongation of survival in a patient. Toxicity and therapeutic efficacy of such compounds can be determined by standard pharmaceutical

10   procedures in cell cultures or experimental animals, *e.g.*, for determining the LD_{50} (the dose lethal to 50% of the population) and the ED_{50} (the dose therapeutically effective in 50% of the population). The dose ratio between toxic and therapeutic effects is the therapeutic index and it can be expressed as the ratio between LD_{50} and ED_{50}. Compounds which exhibit high therapeutic indices are preferred. The data obtained from

15   these cell culture assays and animal studies can be used in formulating a range of dosage for use in human. The dosage of such compounds lies preferably within a range of circulating concentrations that include the ED_{50} with little or no toxicity. The dosage may vary within this range depending upon the dosage form employed and the route of administration utilized. The exact formulation, route of administration and dosage can be

20   chosen by the individual physician in view of the patient's condition. See, *e.g.*, Fingl et al., 1975, in "The Pharmacological Basis of Therapeutics", Ch. 1 p.1. Dosage amount and interval may be adjusted individually to provide plasma levels of the active moiety which are sufficient to maintain the desired effects, or minimal effective concentration (MEC). The MEC will vary for each compound but can be estimated from *in vitro* data.

25   Dosages necessary to achieve the MEC will depend on individual characteristics and route of administration. However, HPLC assays or bioassays can be used to determine plasma concentrations.

Dosage intervals can also be determined using MEC value. Compounds should be administered using a regimen which maintains plasma levels above the MEC for

30   10-90% of the time, preferably between 30-90% and most preferably between 50-90%.

In cases of local administration or selective uptake, the effective local concentration of the drug may not be related to plasma concentration.

An exemplary dosage regimen for polypeptides or other compositions of the invention will be in the range of about 0.01 µg/kg to 100 mg/kg of body weight daily,

5   with the preferred dose being about 0.1 µg/kg to 25 mg/kg of patient body weight daily, varying in adults and children. Dosing may be once daily, or equivalent doses may be delivered at longer or shorter intervals.

The amount of composition administered will, of course, be dependent on the subject being treated, on the subject's age and weight, the severity of the affliction, the

10   manner of administration and the judgment of the prescribing physician.

4.12.4 PACKAGING

The compositions may, if desired, be presented in a pack or dispenser device which may contain one or more unit dosage forms containing the active ingredient. The

15   pack may, for example, comprise metal or plastic foil, such as a blister pack. The pack or dispenser device may be accompanied by instructions for administration. Compositions comprising a compound of the invention formulated in a compatible pharmaceutical carrier may also be prepared, placed in an appropriate container, and labeled for treatment of an indicated condition.

20

4.13 ANTIBODIES

Also included in the invention are antibodies to proteins, or fragments of proteins of the invention. The term "antibody" as used herein refers to immunoglobulin molecules and immunologically active portions of immunoglobulin (Ig) molecules, i.e., molecules

25   that contain an antigen binding site that specifically binds (immunoreacts with) an antigen. Such antibodies include, but are not limited to, polyclonal, monoclonal, chimeric, single chain, F_{ab}, $F_{ab'}$ and $F_{(ab')2}$ fragments, and an F_{ab} expression library. In general, an antibody molecule obtained from humans relates to any of the classes IgG, IgM, IgA, IgE and IgD, which differ from one another by the nature of the heavy chain

30   present in the molecule. Certain classes have subclasses as well, such as IgG_1, IgG_2, and others. Furthermore, in humans, the light chain may be a kappa chain or a lambda chain.

Reference herein to antibodies includes a reference to all such classes, subclasses and types of human antibody species.

An isolated related protein of the invention may be intended to serve as an antigen, or a portion or fragment thereof, and additionally can be used as an immunogen to generate antibodies that immunospecifically bind the antigen, using standard techniques for polyclonal and monoclonal antibody preparation. The full-length protein can be used or, alternatively, the invention provides antigenic peptide fragments of the antigen for use as immunogens. An antigenic peptide fragment comprises at least 6 amino acid residues of the amino acid sequence of the full length protein, such as an amino acid sequence shown in SEQ ID NO: 4, and encompasses an epitope thereof such that an antibody raised against the peptide forms a specific immune complex with the full length protein or with any fragment that contains the epitope. Preferably, the antigenic peptide comprises at least 10 amino acid residues, or at least 15 amino acid residues, or at least 20 amino acid residues, or at least 30 amino acid residues. Preferred epitopes encompassed by the antigenic peptide are regions of the protein that are located on its surface; commonly these are hydrophilic regions.

In certain embodiments of the invention, at least one epitope encompassed by the antigenic peptide is a region of -related protein that is located on the surface of the protein, *e.g.*, a hydrophilic region. A hydrophobicity analysis of the human related protein sequence will indicate which regions of a related protein are particularly hydrophilic and, therefore, are likely to encode surface residues useful for targeting antibody production. As a means for targeting antibody production, hydropathy plots showing regions of hydrophilicity and hydrophobicity may be generated by any method well known in the art, including, for example, the Kyte Doolittle or the Hopp Woods methods, either with or without Fourier transformation. See, *e.g.*, Hopp and Woods, 1981, *Proc. Nat. Acad. Sci. USA* 78: 3824-3828; Kyte and Doolittle 1982, *J. Mol. Biol.* 157: 105-142, each of which is incorporated herein by reference in its entirety. Antibodies that are specific for one or more domains within an antigenic protein, or derivatives, fragments, analogs or homologs thereof, are also provided herein.

A protein of the invention, or a derivative, fragment, analog, homolog or ortholog thereof, may be utilized as an immunogen in the generation of antibodies that immunospecifically bind these protein components.

Various procedures known within the art may be used for the production of
5   polyclonal or monoclonal antibodies directed against a protein of the invention, or against derivatives, fragments, analogs homologs or orthologs thereof (see, for example, Antibodies: A Laboratory Manual, Harlow E, and Lane D, 1988, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, incorporated herein by reference). Some of these antibodies are discussed below.
10

5.13.1 Polyclonal Antibodies

For the production of polyclonal antibodies, various suitable host animals (e.g., rabbit, goat, mouse or other mammal) may be immunized by one or more injections with the native protein, a synthetic variant thereof, or a derivative of the foregoing. An
15   appropriate immunogenic preparation can contain, for example, the naturally occurring immunogenic protein, a chemically synthesized polypeptide representing the immunogenic protein, or a recombinantly expressed immunogenic protein. Furthermore, the protein may be conjugated to a second protein known to be immunogenic in the mammal being immunized. Examples of such immunogenic proteins include but are not
20   limited to keyhole limpet hemocyanin, serum albumin, bovine thyroglobulin, and soybean trypsin inhibitor. The preparation can further include an adjuvant. Various adjuvants used to increase the immunological response include, but are not limited to, Freund's (complete and incomplete), mineral gels (e.g., aluminum hydroxide), surface active substances (e.g., lysolecithin, pluronic polyols, polyanions, peptides, oil emulsions,
25   dinitrophenol, etc.), adjuvants usable in humans such as Bacille Calmette-Guerin and Corynebacterium parvum, or similar immunostimulatory agents. Additional examples of adjuvants which can be employed include MPL-TDM adjuvant (monophosphoryl Lipid A, synthetic trehalose dicorynomycolate).

The polyclonal antibody molecules directed against the immunogenic protein can
30   be isolated from the mammal (e.g., from the blood) and further purified by well known techniques, such as affinity chromatography using protein A or protein G, which provide

primarily the IgG fraction of immune serum. Subsequently, or alternatively, the specific

antigen which is the target of the immunoglobulin sought, or an epitope thereof, may be

immobilized on a column to purify the immune specific antibody by immunoaffinity

chromatography. Purification of immunoglobulins is discussed, for example, by D.

5   Wilkinson (The Scientist, published by The Scientist, Inc., Philadelphia PA, Vol. 14, No.

8 (April 17, 2000), pp. 25-28).

5.13.2 Monoclonal Antibodies

The term "monoclonal antibody" (MAb) or "monoclonal antibody composition",

10   as used herein, refers to a population of antibody molecules that contain only one

molecular species of antibody molecule consisting of a unique light chain gene product

and a unique heavy chain gene product. In particular, the complementarity determining

regions (CDRs) of the monoclonal antibody are identical in all the molecules of the

population. MAbs thus contain an antigen binding site capable of immunoreacting with a

15   particular epitope of the antigen characterized by a unique binding affinity for it.

Monoclonal antibodies can be prepared using hybridoma methods, such as those

described by Kohler and Milstein, Nature, 256:495 (1975). In a hybridoma method, a

mouse, hamster, or other appropriate host animal, is typically immunized with an

immunizing agent to elicit lymphocytes that produce or are capable of producing

20   antibodies that will specifically bind to the immunizing agent. Alternatively, the

lymphocytes can be immunized in vitro.

The immunizing agent will typically include the protein antigen, a fragment thereof or a

fusion protein thereof. Generally, either peripheral blood lymphocytes are used if cells of

human origin are desired, or spleen cells or lymph node cells are used if non-human

25   mammalian sources are desired. The lymphocytes are then fused with an immortalized

cell line using a suitable fusing agent, such as polyethylene glycol, to form a hybridoma

cell (Goding, Monoclonal Antibodies: Principles and Practice, Academic Press, (1986)

pp. 59-103). Immortalized cell lines are usually transformed mammalian cells,

particularly myeloma cells of rodent, bovine and human origin. Usually, rat or mouse

30   myeloma cell lines are employed. The hybridoma cells can be cultured in a suitable

culture medium that preferably contains one or more substances that inhibit the growth or

survival of the unfused, immortalized cells. For example, if the parental cells lack the
enzyme hypoxanthine guanine phosphoribosyl transferase (HGPRT or HPRT), the
culture medium for the hybridomas typically will include hypoxanthine, aminopterin, and
thymidine ("HAT medium"), which substances prevent the growth of HGPRT-deficient

5   cells.

Preferred immortalized cell lines are those that fuse efficiently, support stable
high level expression of antibody by the selected antibody-producing cells, and are
sensitive to a medium such as HAT medium. More preferred immortalized cell lines are
murine myeloma lines, which can be obtained, for instance, from the Salk Institute Cell

10   Distribution Center, San Diego, California and the American Type Culture Collection,
Manassas, Virginia. Human myeloma and mouse-human heteromyeloma cell lines also
have been described for the production of human monoclonal antibodies (Kozbor, J.
Immunol., 133:3001 (1984); Brodeur et al., Monoclonal Antibody Production Techniques
and Applications, Marcel Dekker, Inc., New York, (1987) pp. 51-63).

15   The culture medium in which the hybridoma cells are cultured can then be
assayed for the presence of monoclonal antibodies directed against the antigen.
Preferably, the binding specificity of monoclonal antibodies produced by the hybridoma
cells is determined by immunoprecipitation or by an in vitro binding assay, such as
radioimmunoassay (RIA) or enzyme-linked immunoabsorbent assay (ELISA). Such

20   techniques and assays are known in the art. The binding affinity of the monoclonal
antibody can, for example, be determined by the Scatchard analysis of Munson and
Pollard, Anal. Biochem., 107:220 (1980). Preferably, antibodies having a high degree of
specificity and a high binding affinity for the target antigen are isolated.

After the desired hybridoma cells are identified, the clones can be subcloned by

25   limiting dilution procedures and grown by standard methods. Suitable culture media for
this purpose include, for example, Dulbecco's Modified Eagle's Medium and RPMI-1640
medium. Alternatively, the hybridoma cells can be grown in vivo as ascites in a
mammal.

The monoclonal antibodies secreted by the subclones can be isolated or purified from the

30   culture medium or ascites fluid by conventional immunoglobulin purification procedures

such as, for example, protein A-Sepharose, hydroxylapatite chromatography, gel electrophoresis, dialysis, or affinity chromatography.

The monoclonal antibodies can also be made by recombinant DNA methods, such as those described in U.S. Patent No. 4,816,567. DNA encoding the monoclonal

5   antibodies of the invention can be readily isolated and sequenced using conventional procedures (e.g., by using oligonucleotide probes that are capable of binding specifically to genes encoding the heavy and light chains of murine antibodies). The hybridoma cells of the invention serve as a preferred source of such DNA. Once isolated, the DNA can be placed into expression vectors, which are then transfected into host cells such as

10 simian COS cells, Chinese hamster ovary (CHO) cells, or myeloma cells that do not otherwise produce immunoglobulin protein, to obtain the synthesis of monoclonal antibodies in the recombinant host cells. The DNA also can be modified, for example, by substituting the coding sequence for human heavy and light chain constant domains in place of the homologous murine sequences (U.S. Patent No. 4,816,567; Morrison, Nature

15 368, 812-13 (1994)) or by covalently joining to the immunoglobulin coding sequence all or part of the coding sequence for a non-immunoglobulin polypeptide. Such a non-immunoglobulin polypeptide can be substituted for the constant domains of an antibody of the invention, or can be substituted for the variable domains of one antigen-combining site of an antibody of the invention to create a chimeric bivalent antibody.

20

5.13.2 Humanized Antibodies

The antibodies directed against the protein antigens of the invention can further comprise humanized antibodies or human antibodies. These antibodies are suitable for administration to humans without engendering an immune response by the human against

25 the administered immunoglobulin. Humanized forms of antibodies are chimeric immunoglobulins, immunoglobulin chains or fragments thereof (such as Fv, Fab, Fab', F(ab')$_2$ or other antigen-binding subsequences of antibodies) that are principally comprised of the sequence of a human immunoglobulin, and contain minimal sequence derived from a non-human immunoglobulin. Humanization can be performed following

30 the method of Winter and co-workers (Jones et al., Nature, 321:522-525 (1986); Riechmann et al., Nature, 332:323-327 (1988); Verhoeyen et al., Science, 239:1534-1536

(1988)), by substituting rodent CDRs or CDR sequences for the corresponding sequences of a human antibody. (See also U.S. Patent No. 5,225,539.) In some instances, Fv framework residues of the human immunoglobulin are replaced by corresponding non-human residues. Humanized antibodies can also comprise residues which are found

5   neither in the recipient antibody nor in the imported CDR or framework sequences. In general, the humanized antibody will comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the CDR regions correspond to those of a non-human immunoglobulin and all or substantially all of the framework regions are those of a human immunoglobulin consensus sequence. The

10   humanized antibody optimally also will comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin (Jones et al., 1986; Riechmann et al., 1988; and Presta, Curr. Op. Struct. Biol., 2:593-596 (1992)).

5.13.3 Human Antibodies

15   Fully human antibodies relate to antibody molecules in which essentially the entire sequences of both the light chain and the heavy chain, including the CDRs, arise from human genes. Such antibodies are termed "human antibodies", or "fully human antibodies" herein. Human monoclonal antibodies can be prepared by the trioma technique; the human B-cell hybridoma technique (see Kozbor, et al., 1983 Immunol

20   Today 4: 72) and the EBV hybridoma technique to produce human monoclonal antibodies (see Cole, et al., 1985 In: MONOCLONAL ANTIBODIES AND CANCER THERAPY, Alan R. Liss, Inc., pp. 77-96). Human monoclonal antibodies may be utilized in the practice of the present invention and may be produced by using human hybridomas (see Cote, et al., 1983. Proc Natl Acad Sci USA 80: 2026-2030) or by transforming human

25   B-cells with Epstein Barr Virus in vitro (see Cole, et al., 1985 In: MONOCLONAL ANTIBODIES AND CANCER THERAPY, Alan R. Liss, Inc., pp. 77-96).

In addition, human antibodies can also be produced using additional techniques, including phage display libraries (Hoogenboom and Winter, J. Mol. Biol., 227:381 (1991); Marks et al., J. Mol. Biol., 222:581 (1991)). Similarly, human antibodies can be

30   made by introducing human immunoglobulin loci into transgenic animals, e.g., mice in which the endogenous immunoglobulin genes have been partially or completely

inactivated. Upon challenge, human antibody production is observed, which closely resembles that seen in humans in all respects, including gene rearrangement, assembly, and antibody repertoire. This approach is described, for example, in U.S. Patent Nos. 5,545,807; 5,545,806; 5,569,825; 5,625,126; 5,633,425; 5,661,016, and in Marks et al.

5 (Bio/Technology 10, 779-783 (1992)); Lonberg et al. (Nature 368 856-859 (1994)); Morrison (Nature 368, 812-13 (1994)); Fishwild et al,(Nature Biotechnology 14, 845-51 (1996)); Neuberger (Nature Biotechnology 14, 826 (1996)); and Lonberg and Huszar (Intern. Rev. Immunol. 13 65-93 (1995)).

Human antibodies may additionally be produced using transgenic nonhuman

10 animals which are modified so as to produce fully human antibodies rather than the animal's endogenous antibodies in response to challenge by an antigen. (See PCT publication WO94/02602). The endogenous genes encoding the heavy and light immunoglobulin chains in the nonhuman host have been incapacitated, and active loci encoding human heavy and light chain immunoglobulins are inserted into the host's

15 genome. The human genes are incorporated, for example, using yeast artificial chromosomes containing the requisite human DNA segments. An animal which provides all the desired modifications is then obtained as progeny by crossbreeding intermediate transgenic animals containing fewer than the full complement of the modifications. The preferred embodiment of such a nonhuman animal is a mouse, and is termed the

20 Xenomouse™ as disclosed in PCT publications WO 96/33735 and WO 96/34096. This animal produces B cells which secrete fully human immunoglobulins. The antibodies can be obtained directly from the animal after immunization with an immunogen of interest, as, for example, a preparation of a polyclonal antibody, or alternatively from immortalized B cells derived from the animal, such as hybridomas producing monoclonal

25 antibodies. Additionally, the genes encoding the immunoglobulins with human variable regions can be recovered and expressed to obtain the antibodies directly, or can be further modified to obtain analogs of antibodies such as, for example, single chain Fv molecules.

An example of a method of producing a nonhuman host, exemplified as a mouse, lacking expression of an endogenous immunoglobulin heavy chain is disclosed in U.S.

30 Patent No. 5,939,598. It can be obtained by a method including deleting the J segment genes from at least one endogenous heavy chain locus in an embryonic stem cell to

prevent rearrangement of the locus and to prevent formation of a transcript of a

rearranged immunoglobulin heavy chain locus, the deletion being effected by a targeting

vector containing a gene encoding a selectable marker; and producing from the

embryonic stem cell a transgenic mouse whose somatic and germ cells contain the gene

5   encoding the selectable marker.

A method for producing an antibody of interest, such as a human antibody, is

disclosed in U.S. Patent No. 5,916,771. It includes introducing an expression vector that

contains a nucleotide sequence encoding a heavy chain into one mammalian host cell in

culture, introducing an expression vector containing a nucleotide sequence encoding a

10   light chain into another mammalian host cell, and fusing the two cells to form a hybrid

cell. The hybrid cell expresses an antibody containing the heavy chain and the light

chain.

In a further improvement on this procedure, a method for identifying a clinically

relevant epitope on an immunogen, and a correlative method for selecting an antibody

15   that binds immunospecifically to the relevant epitope with high affinity, are disclosed in

PCT publication WO 99/53049.

5.13.4 F_{ab} Fragments and Single Chain Antibodies

According to the invention, techniques can be adapted for the production of

20   single-chain antibodies specific to an antigenic protein of the invention (see e.g., U.S.

Patent No. 4,946,778). In addition, methods can be adapted for the construction of F_{ab}

expression libraries (see e.g., Huse, et al., 1989 Science 246: 1275-1281) to allow rapid

and effective identification of monoclonal F_{ab} fragments with the desired specificity for a

protein or derivatives, fragments, analogs or homologs thereof. Antibody fragments that

25   contain the idiotypes to a protein antigen may be produced by techniques known in the

art including, but not limited to: (i) an $F_{(ab')2}$ fragment produced by pepsin digestion of an

antibody molecule; (ii) an F_{ab} fragment generated by reducing the disulfide bridges of an

$F_{(ab')2}$ fragment; (iii) an F_{ab} fragment generated by the treatment of the antibody molecule

with papain and a reducing agent and (iv) F_v fragments.

30

5.13.5 Bispecific Antibodies

Bispecific antibodies are monoclonal, preferably human or humanized, antibodies that have binding specificities for at least two different antigens. In the present case, one of the binding specificities is for an antigenic protein of the invention. The second binding target is any other antigen, and advantageously is a cell-surface protein or

5   receptor or receptor subunit.

Methods for making bispecific antibodies are known in the art. Traditionally, the recombinant production of bispecific antibodies is based on the co-expression of two immunoglobulin heavy-chain/light-chain pairs, where the two heavy chains have different specificities (Milstein and Cuello, Nature, 305:537-539 (1983)). Because of the

10   random assortment of immunoglobulin heavy and light chains, these hybridomas (quadromas) produce a potential mixture of ten different antibody molecules, of which only one has the correct bispecific structure. The purification of the correct molecule is usually accomplished by affinity chromatography steps. Similar procedures are disclosed in WO 93/08829, published 13 May 1993, and in Traunecker et al., 1991 EMBO J.,

15   10:3655-3659.

Antibody variable domains with the desired binding specificities (antibody-antigen combining sites) can be fused to immunoglobulin constant domain sequences. The fusion preferably is with an immunoglobulin heavy-chain constant domain, comprising at least part of the hinge, CH2, and CH3 regions. It is preferred to have the

20   first heavy-chain constant region (CH1) containing the site necessary for light-chain binding present in at least one of the fusions. DNAs encoding the immunoglobulin heavy-chain fusions and, if desired, the immunoglobulin light chain, are inserted into separate expression vectors, and are co-transfected into a suitable host organism. For further details of generating bispecific antibodies see, for example, Suresh et al., Methods

25   in Enzymology, 121:210 (1986).

According to another approach described in WO 96/27011, the interface between a pair of antibody molecules can be engineered to maximize the percentage of heterodimers which are recovered from recombinant cell culture. The preferred interface comprises at least a part of the CH3 region of an antibody constant domain. In this

30   method, one or more small amino acid side chains from the interface of the first antibody molecule are replaced with larger side chains (e.g. tyrosine or tryptophan).

Compensatory "cavities" of identical or similar size to the large side chain(s) are created

on the interface of the second antibody molecule by replacing large amino acid side

chains with smaller ones (e.g. alanine or threonine). This provides a mechanism for

increasing the yield of the heterodimer over other unwanted end-products such as

5   homodimers.

Bispecific antibodies can be prepared as full length antibodies or antibody

fragments (e.g. F(ab')$_2$ bispecific antibodies). Techniques for generating bispecific

antibodies from antibody fragments have been described in the literature. For example,

bispecific antibodies can be prepared using chemical linkage. Brennan et al., Science

10   229:81 (1985) describe a procedure wherein intact antibodies are proteolytically cleaved

to generate F(ab')$_2$ fragments. These fragments are reduced in the presence of the dithiol

complexing agent sodium arsenite to stabilize vicinal dithiols and prevent intermolecular

disulfide formation. The Fab' fragments generated are then converted to

thionitrobenzoate (TNB) derivatives. One of the Fab'-TNB derivatives is then

15   reconverted to the Fab'-thiol by reduction with mercaptoethylamine and is mixed with an

equimolar amount of the other Fab'-TNB derivative to form the bispecific antibody. The

bispecific antibodies produced can be used as agents for the selective immobilization of

enzymes.

Additionally, Fab' fragments can be directly recovered from E. coli and

20   chemically coupled to form bispecific antibodies. Shalaby et al., J. Exp. Med.

175:217-225 (1992) describe the production of a fully humanized bispecific antibody

F(ab')$_2$ molecule. Each Fab' fragment was separately secreted from E. coli and subjected

to directed chemical coupling in vitro to form the bispecific antibody. The bispecific

antibody thus formed was able to bind to cells overexpressing the ErbB2 receptor and

25   normal human T cells, as well as trigger the lytic activity of human cytotoxic

lymphocytes against human breast tumor targets.

Various techniques for making and isolating bispecific antibody fragments

directly from recombinant cell culture have also been described. For example, bispecific

antibodies have been produced using leucine zippers. Kostelny et al., J. Immunol.

30   148(5):1547-1553 (1992). The leucine zipper peptides from the Fos and Jun proteins

were linked to the Fab' portions of two different antibodies by gene fusion. The antibody

homodimers were reduced at the hinge region to form monomers and then re-oxidized to form the antibody heterodimers. This method can also be utilized for the production of antibody homodimers. The "diabody" technology described by Hollinger et al., Proc. Natl. Acad. Sci. USA 90:6444-6448 (1993) has provided an alternative mechanism for

5   making bispecific antibody fragments. The fragments comprise a heavy-chain variable domain (V_H) connected to a light-chain variable domain (V_L) by a linker which is too short to allow pairing between the two domains on the same chain. Accordingly, the V_H and V_L domains of one fragment are forced to pair with the complementary V_L and V_H domains of another fragment, thereby forming two antigen-binding sites. Another

10   strategy for making bispecific antibody fragments by the use of single-chain Fv (sFv) dimers has also been reported. See, Gruber et al., J. Immunol. 152:5368 (1994).

Antibodies with more than two valencies are contemplated. For example, trispecific antibodies can be prepared. Tutt et al., J. Immunol. 147:60 (1991). Exemplary bispecific antibodies can bind to two different epitopes, at least one of which

15   originates in the protein antigen of the invention. Alternatively, an anti-antigenic arm of an immunoglobulin molecule can be combined with an arm which binds to a triggering molecule on a leukocyte such as a T-cell receptor molecule (e.g. CD2, CD3, CD28, or B7), or Fc receptors for IgG (FcγR), such as FcγRI (CD64), FcγRII (CD32) and FcγRIII (CD16) so as to focus cellular defense mechanisms to the cell expressing the particular

20   antigen. Bispecific antibodies can also be used to direct cytotoxic agents to cells which express a particular antigen. These antibodies possess an antigen-binding arm and an arm which binds a cytotoxic agent or a radionuclide chelator, such as EOTUBE, DPTA, DOTA, or TETA. Another bispecific antibody of interest binds the protein antigen described herein and further binds tissue factor (TF).

25

5.13.6 Heteroconjugate Antibodies

Heteroconjugate antibodies are also within the scope of the present invention. Heteroconjugate antibodies are composed of two covalently joined antibodies. Such antibodies have, for example, been proposed to target immune system cells to unwanted

30   cells (U.S. Patent No. 4,676,980), and for treatment of HIV infection (WO 91/00360; WO 92/200373; EP 03089). It is contemplated that the antibodies can be prepared in

vitro using known methods in synthetic protein chemistry, including those involving

crosslinking agents. For example, immunotoxins can be constructed using a disulfide

exchange reaction or by forming a thioether bond. Examples of suitable reagents for this

purpose include iminothiolate and methyl-4-mercaptobutyrimidate and those disclosed,

5　　for example, in U.S. Patent No. 4,676,980.

5.13.7 Effector Function Engineering

It can be desirable to modify the antibody of the invention with respect to effector

function, so as to enhance, e.g., the effectiveness of the antibody in treating cancer. For

10　　example, cysteine residue(s) can be introduced into the Fc region, thereby allowing

interchain disulfide bond formation in this region. The homodimeric antibody thus

generated can have improved internalization capability and/or increased complement-

mediated cell killing and antibody-dependent cellular cytotoxicity (ADCC). See Caron et

al., J. Exp Med., 176: 1191-1195 (1992) and Shopes, J. Immunol., 148: 2918-2922

15　　(1992). Homodimeric antibodies with enhanced anti-tumor activity can also be prepared

using heterobifunctional cross-linkers as described in Wolff et al. Cancer Research, 53:

2560-2565 (1993). Alternatively, an antibody can be engineered that has dual Fc regions

and can thereby have enhanced complement lysis and ADCC capabilities. See Stevenson

et al., Anti-Cancer Drug Design, 3: 219-230 (1989).

20

5.13.8 Immunoconjugates

The invention also pertains to immunoconjugates comprising an antibody

conjugated to a cytotoxic agent such as a chemotherapeutic agent, toxin (e.g., an

enzymatically active toxin of bacterial, fungal, plant, or animal origin, or fragments

25　　thereof), or a radioactive isotope (i.e., a radioconjugate).

Chemotherapeutic agents useful in the generation of such immunoconjugates have

been described above. Enzymatically active toxins and fragments thereof that can be

used include diphtheria A chain, nonbinding active fragments of diphtheria toxin,

exotoxin A chain (from Pseudomonas aeruginosa), ricin A chain, abrin A chain,

30　　modeccin A chain, alpha-sarcin, Aleurites fordii proteins, dianthin proteins, Phytolaca

americana proteins (PAPI, PAPII, and PAP-S), momordica charantia inhibitor, curcin,

crotin, sapaonaria officinalis inhibitor, gelonin, mitogellin, restrictocin, phenomycin, enomycin, and the tricothecenes. A variety of radionuclides are available for the production of radioconjugated antibodies. Examples include ^{212}Bi, ^{131}I, ^{131}In, ^{90}Y, and ^{186}Re.

5   Conjugates of the antibody and cytotoxic agent are made using a variety of bifunctional protein-coupling agents such as N-succinimidyl-3-(2-pyridyldithiol) propionate (SPDP), iminothiolane (IT), bifunctional derivatives of imidoesters (such as dimethyl adipimidate HCL), active esters (such as disuccinimidyl suberate), aldehydes (such as glutareldehyde), bis-azido compounds (such as bis (p-azidobenzoyl)

10   hexanediamine), bis-diazonium derivatives (such as bis-(p-diazoniumbenzoyl)-ethylenediamine), diisocyanates (such as tolyene 2,6-diisocyanate), and bis-active fluorine compounds (such as 1,5-difluoro-2,4-dinitrobenzene). For example, a ricin immunotoxin can be prepared as described in Vitetta et al., Science, 238: 1098 (1987). Carbon-14-labeled 1-isothiocyanatobenzyl-3-methyldiethylene triaminepentaacetic acid

15   (MX-DTPA) is an exemplary chelating agent for conjugation of radionucleotide to the antibody. See WO94/11026.

In another embodiment, the antibody can be conjugated to a "receptor" (such streptavidin) for utilization in tumor pretargeting wherein the antibody-receptor conjugate is administered to the patient, followed by removal of unbound conjugate from the

20   circulation using a clearing agent and then administration of a "ligand" (e.g., avidin) that is in turn conjugated to a cytotoxic agent.

4.14 COMPUTER READABLE SEQUENCES

In one application of this embodiment, a nucleotide sequence of the present

25   invention can be recorded on computer readable media. As used herein, "computer readable media" refers to any medium which can be read and accessed directly by a computer. Such media include, but are not limited to: magnetic storage media, such as floppy discs, hard disc storage medium, and magnetic tape; optical storage media such as CD-ROM; electrical storage media such as RAM and ROM; and hybrids of these

30   categories such as magnetic/optical storage media. A skilled artisan can readily appreciate how any of the presently known computer readable mediums can be used to

create a manufacture comprising computer readable medium having recorded thereon a nucleotide sequence of the present invention. As used herein, "recorded" refers to a process for storing information on computer readable medium. A skilled artisan can readily adopt any of the presently known methods for recording information on computer

5   readable medium to generate manufactures comprising the nucleotide sequence information of the present invention.

A variety of data storage structures are available to a skilled artisan for creating a computer readable medium having recorded thereon a nucleotide sequence of the present invention. The choice of the data storage structure will generally be based on the means

10   chosen to access the stored information. In addition, a variety of data processor programs and formats can be used to store the nucleotide sequence information of the present invention on computer readable medium. The sequence information can be represented in a word processing text file, formatted in commercially-available software such as WordPerfect and Microsoft Word, or represented in the form of an ASCII file, stored in a

15   database application, such as DB2, Sybase, Oracle, or the like. A skilled artisan can readily adapt any number of data processor structuring formats (e.g. text file or database) in order to obtain computer readable medium having recorded thereon the nucleotide sequence information of the present invention.

By providing any of the nucleotide sequences SEQ ID NO:1-739 or a

20   representative fragment thereof; or a nucleotide sequence at least 95% identical to any of the nucleotide sequences of SEQ ID NO:1-739 in computer readable form, a skilled artisan can routinely access the sequence information for a variety of purposes. Computer software is publicly available which allows a skilled artisan to access sequence information provided in a computer readable medium. The examples which follow

25   demonstrate how software which implements the BLAST (Altschul et al., J. Mol. Biol. 215:403-410 (1990)) and BLAZE (Brutlag et al., Comp. Chem. 17:203-207 (1993)) search algorithms on a Sybase system is used to identify open reading frames (ORFs) within a nucleic acid sequence. Such ORFs may be protein encoding fragments and may be useful in producing commercially important proteins such as enzymes used in

30   fermentation reactions and in the production of commercially useful metabolites.

As used herein, "a computer-based system" refers to the hardware means, software means, and data storage means used to analyze the nucleotide sequence information of the present invention. The minimum hardware means of the computer-based systems of the present invention comprises a central processing unit

5   (CPU), input means, output means, and data storage means. A skilled artisan can readily appreciate that any one of the currently available computer-based systems are suitable for use in the present invention. As stated above, the computer-based systems of the present invention comprise a data storage means having stored therein a nucleotide sequence of the present invention and the necessary hardware means and software means for

10   supporting and implementing a search means. As used herein, "data storage means" refers to memory which can store nucleotide sequence information of the present invention, or a memory access means which can access manufactures having recorded thereon the nucleotide sequence information of the present invention.

As used herein, "search means" refers to one or more programs which are

15   implemented on the computer-based system to compare a target sequence or target structural motif with the sequence information stored within the data storage means. Search means are used to identify fragments or regions of a known sequence which match a particular target sequence or target motif. A variety of known algorithms are disclosed publicly and a variety of commercially available software for conducting search

20   means are and can be used in the computer-based systems of the present invention. Examples of such software includes, but is not limited to, Smith-Waterman, MacPattern (EMBL), BLASTN and BLASTA (NPOLYPEPTIDEIA). A skilled artisan can readily recognize that any one of the available algorithms or implementing software packages for conducting homology searches can be adapted for use in the present computer-based

25   systems. As used herein, a "target sequence" can be any nucleic acid or amino acid sequence of six or more nucleotides or two or more amino acids. A skilled artisan can readily recognize that the longer a target sequence is, the less likely a target sequence will be present as a random occurrence in the database. The most preferred sequence length of a target sequence is from about 10 to 300 amino acids, more preferably from about 30

30   to 100 nucleotide residues. However, it is well recognized that searches for

commercially important fragments, such as sequence fragments involved in gene expression and protein processing, may be of shorter length.

As used herein, "a target structural motif," or "target motif," refers to any rationally selected sequence or combination of sequences in which the sequence(s) are

5   chosen based on a three-dimensional configuration which is formed upon the folding of the target motif. There are a variety of target motifs known in the art. Protein target motifs include, but are not limited to, enzyme active sites and signal sequences. Nucleic acid target motifs include, but are not limited to, promoter sequences, hairpin structures and inducible expression elements (protein binding sequences).

10

4.15 TRIPLE HELIX FORMATION

In addition, the fragments of the present invention, as broadly described, can be used to control gene expression through triple helix formation or antisense DNA or RNA, both of which methods are based on the binding of a polynucleotide sequence to DNA or

15   RNA. Polynucleotides suitable for use in these methods are preferably 20 to 40 bases in length and are designed to be complementary to a region of the gene involved in transcription (triple helix - see Lee et al., Nucl. Acids Res. 6:3073 (1979); Cooney et al., Science 15241:456 (1988); and Dervan et al., Science 251:1360 (1991)) or to the mRNA itself (antisense - Olmno, J. Neurochem. 56:560 (1991); Oligodeoxynucleotides as

20   Antisense Inhibitors of Gene Expression, CRC Press, Boca Raton, FL (1988)). Triple helix-formation optimally results in a shut-off of RNA transcription from DNA, while antisense RNA hybridization blocks translation of an mRNA molecule into polypeptide. Both techniques have been demonstrated to be effective in model systems. Information contained in the sequences of the present invention is necessary for the design of an

25   antisense or triple helix oligonucleotide.

4.16 DIAGNOSTIC ASSAYS AND KITS

The present invention further provides methods to identify the presence or expression of one of the ORFs of the present invention, or homolog thereof, in a test

30   sample, using a nucleic acid probe or antibodies of the present invention, optionally conjugated or otherwise associated with a suitable label.

In general, methods for detecting a polynucleotide of the invention can comprise contacting a sample with a compound that binds to and forms a complex with the polynucleotide for a period sufficient to form the complex, and detecting the complex, so that if a complex is detected, a polynucleotide of the invention is detected in the sample.

5   Such methods can also comprise contacting a sample under stringent hybridization conditions with nucleic acid primers that anneal to a polynucleotide of the invention under such conditions, and amplifying annealed polynucleotides, so that if a polynucleotide is amplified, a polynucleotide of the invention is detected in the sample.

In general, methods for detecting a polypeptide of the invention can comprise
10   contacting a sample with a compound that binds to and forms a complex with the polypeptide for a period sufficient to form the complex, and detecting the complex, so that if a complex is detected, a polypeptide of the invention is detected in the sample.

In detail, such methods comprise incubating a test sample with one or more of the antibodies or one or more of the nucleic acid probes of the present invention and assaying
15   for binding of the nucleic acid probes or antibodies to components within the test sample.

Conditions for incubating a nucleic acid probe or antibody with a test sample vary. Incubation conditions depend on the format employed in the assay, the detection methods employed, and the type and nature of the nucleic acid probe or antibody used in the assay. One skilled in the art will recognize that any one of the commonly available
20   hybridization, amplification or immunological assay formats can readily be adapted to employ the nucleic acid probes or antibodies of the present invention. Examples of such assays can be found in Chard, T., An Introduction to Radioimmunoassay and Related Techniques, Elsevier Science Publishers, Amsterdam, The Netherlands (1986); Bullock, G.R. et al., Techniques in Immunocytochemistry, Academic Press, Orlando, FL Vol. 1
25   (1982), Vol. 2 (1983), Vol. 3 (1985); Tijssen, P., Practice and Theory of immunoassays: Laboratory Techniques in Biochemistry and Molecular Biology, Elsevier Science Publishers, Amsterdam, The Netherlands (1985). The test samples of the present invention include cells, protein or membrane extracts of cells, or biological fluids such as sputum, blood, serum, plasma, or urine. The test sample used in the above-described
30   method will vary based on the assay format, nature of the detection method and the tissues, cells or extracts used as the sample to be assayed. Methods for preparing protein

spotted on nylon membrane filters and screened with oligonucleotide probes (e.g., 7-mers) to obtain signature sequences. The clones were clustered into groups of similar or identical sequences. Representative clones were selected for sequencing.

5　　　　In some cases, the 5' sequence of the amplified inserts was then deduced using a typical Sanger sequencing protocol. PCR products were purified and subjected to fluorescent dye terminator cycle sequencing. Single pass gel sequencing was done using a 377 Applied Biosystems (ABI) sequencer to obtain the novel nucleic acid sequences. In some cases RACE (Random Amplification of cDNA Ends) was performed to further extend the sequence in the 5' direction.

10

5.2　　　EXAMPLE 2

Novel Contigs

　　　　The novel contigs of the invention were assembled from sequences that were obtained from a cDNA library by methods described in Example 1 above, and in some cases

15　　sequences obtained from one or more public databases. Chromatograms were base called and assembled using a software suite from University of Washington, Seattle containing three applications designated PHRED, PHRAP, and CONSED. The sequences for the resulting nucleic acid contigs are designated as SEQ ID NO: 1-739 and are provided in the attached Sequence Listing. The contigs were assembled using an EST sequence as a seed.

20　　Then a recursive algorithm was used to extend the seed EST into an extended assemblage, by pulling additional sequences from different databases (i.e., Hyseq's database containing EST sequences, dbEST version 120, gb pri 120, UniGene version 120, and Genpept 120) that belong to this assemblage. The algorithm terminated when there was no additional sequences from the above databases that would extend the assemblage. Inclusion of

25　　component sequences into the assemblage was based on a BLASTN hit to the extending assemblage with BLAST score greater than 300 and percent identity greater than 95%.

　　　　The nearest neighbor result for the assembled contig was obtained by a FASTA version 3 search against Genpept release 120, using FASTXY algorithm. FASTXY is an improved version of FASTA alignment which allows in-codon frame shifts. The nearest

30　　neighbor result showed the closest homologue for each assemblage from Genpept (and

extracts or membrane extracts of cells are well known in the art and can be readily be adapted in order to obtain a sample which is compatible with the system utilized.

In another embodiment of the present invention, kits are provided which contain the necessary reagents to carry out the assays of the present invention. Specifically, the

5   invention provides a compartment kit to receive, in close confinement, one or more containers which comprises: (a) a first container comprising one of the probes or antibodies of the present invention; and (b) one or more other containers comprising one or more of the following: wash reagents, reagents capable of detecting presence of a bound probe or antibody.

10   In detail, a compartment kit includes any kit in which reagents are contained in separate containers. Such containers include small glass containers, plastic containers or strips of plastic or paper. Such containers allows one to efficiently transfer reagents from one compartment to another compartment such that the samples and reagents are not cross-contaminated, and the agents or solutions of each container can be added in a

15   quantitative fashion from one compartment to another. Such containers will include a container which will accept the test sample, a container which contains the antibodies used in the assay, containers which contain wash reagents (such as phosphate buffered saline, Tris-buffers, etc.), and containers which contain the reagents used to detect the bound antibody or probe. Types of detection reagents include labeled nucleic acid probes,

20   labeled secondary antibodies, or in the alternative, if the primary antibody is labeled, the enzymatic, or antibody binding reagents which are capable of reacting with the labeled antibody. One skilled in the art will readily recognize that the disclosed probes and antibodies of the present invention can be readily incorporated into one of the established kit formats which are well known in the art.

25

4.17 MEDICAL IMAGING

The novel polypeptides and binding partners of the invention are useful in medical imaging of sites expressing the molecules of the invention (e.g., where the polypeptide of the invention is involved in the immune response, for imaging sites of

30   inflammation or infection). See, e.g., Kunkel et al., U.S. Pat. NO. 5,413,778. Such methods involve chemical attachment of a labeling or imaging agent, administration of

the labeled polypeptide to a subject in a pharmaceutically acceptable carrier, and imaging the labeled polypeptide *in vivo* at the target site.

4.18 SCREENING ASSAYS

5   Using the isolated proteins and polynucleotides of the invention, the present invention further provides methods of obtaining and identifying agents which bind to a polypeptide encoded by an ORF corresponding to any of the nucleotide sequences set forth in SEQ ID NO:1-739, or bind to a specific domain of the polypeptide encoded by the nucleic acid. In detail, said method comprises the steps of:

10   (a)   contacting an agent with an isolated protein encoded by an ORF of the present invention, or nucleic acid of the invention; and

(b)   determining whether the agent binds to said protein or said nucleic acid.

In general, therefore, such methods for identifying compounds that bind to a polynucleotide of the invention can comprise contacting a compound with a

15   polynucleotide of the invention for a time sufficient to form a polynucleotide/compound complex, and detecting the complex, so that if a polynucleotide/compound complex is detected, a compound that binds to a polynucleotide of the invention is identified.

Likewise, in general, therefore, such methods for identifying compounds that bind to a polypeptide of the invention can comprise contacting a compound with a polypeptide

20   of the invention for a time sufficient to form a polypeptide/compound complex, and detecting the complex, so that if a polypeptide/compound complex is detected, a compound that binds to a polynucleotide of the invention is identified.

Methods for identifying compounds that bind to a polypeptide of the invention can also comprise contacting a compound with a polypeptide of the invention in a cell for

25   a time sufficient to form a polypeptide/compound complex, wherein the complex drives expression of a receptor gene sequence in the cell, and detecting the complex by detecting reporter gene sequence expression, so that if a polypeptide/compound complex is detected, a compound that binds a polypeptide of the invention is identified.

Compounds identified via such methods can include compounds which modulate

30   the activity of a polypeptide of the invention (that is, increase or decrease its activity, relative to activity observed in the absence of the compound). Alternatively, compounds

identified via such methods can include compounds which modulate the expression of a polynucleotide of the invention (that is, increase or decrease expression relative to expression levels observed in the absence of the compound). Compounds, such as compounds identified via the methods of the invention, can be tested using standard

5   assays well known to those of skill in the art for their ability to modulate activity/expression.

The agents screened in the above assay can be, but are not limited to, peptides, carbohydrates, vitamin derivatives, or other pharmaceutical agents. The agents can be selected and screened at random or rationally selected or designed using protein modeling

10   techniques.

For random screening, agents such as peptides, carbohydrates, pharmaceutical agents and the like are selected at random and are assayed for their ability to bind to the protein encoded by the ORF of the present invention. Alternatively, agents may be rationally selected or designed. As used herein, an agent is said to be "rationally selected

15   or designed" when the agent is chosen based on the configuration of the particular protein. For example, one skilled in the art can readily adapt currently available procedures to generate peptides, pharmaceutical agents and the like, capable of binding to a specific peptide sequence, in order to generate rationally designed antipeptide peptides, for example see Hurby et al., Application of Synthetic Peptides: Antisense Peptides," In

20   Synthetic Peptides, A User's Guide, W.H. Freeman, NY (1992), pp. 289-307, and Kaspczak et al., Biochemistry 28:9230-8 (1989), or pharmaceutical agents, or the like.

In addition to the foregoing, one class of agents of the present invention, as broadly described, can be used to control gene expression through binding to one of the ORFs or EMFs of the present invention. As described above, such agents can be

25   randomly screened or rationally designed/selected. Targeting the ORF or EMF allows a skilled artisan to design sequence specific or element specific agents, modulating the expression of either a single ORF or multiple ORFs which rely on the same EMF for expression control. One class of DNA binding agents are agents which contain base residues which hybridize or form a triple helix formation by binding to DNA or RNA.

30   Such agents can be based on the classic phosphodiester, ribonucleic acid backbone, or

can be a variety of sulfhydryl or polymeric derivatives which have base attachment
capacity.

　　　　Agents suitable for use in these methods preferably contain 20 to 40 bases and are
designed to be complementary to a region of the gene involved in transcription (triple

5　　helix - see Lee et al., Nucl. Acids Res. 6:3073 (1979); Cooney et al., Science 241:456
(1988); and Dervan et al., Science 251:1360 (1991)) or to the mRNA itself (antisense -
Okano, J. Neurochem. 56:560 (1991); Oligodeoxynucleotides as Antisense Inhibitors of
Gene Expression, CRC Press, Boca Raton, FL (1988)). Triple helix-formation optimally
results in a shut-off of RNA transcription from DNA, while antisense RNA hybridization

10　blocks translation of an mRNA molecule into polypeptide. Both techniques have been
demonstrated to be effective in model systems. Information contained in the sequences
of the present invention is necessary for the design of an antisense or triple helix
oligonucleotide and other DNA binding agents.

　　　　Agents which bind to a protein encoded by one of the ORFs of the present

15　invention can be used as a diagnostic agent. Agents which bind to a protein encoded by
one of the ORFs of the present invention can be formulated using known techniques to
generate a pharmaceutical composition.

4.19 USE OF NUCLEIC ACIDS AS PROBES

20　　　　Another aspect of the subject invention is to provide for polypeptide-specific
nucleic acid hybridization probes capable of hybridizing with naturally occurring
nucleotide sequences. The hybridization probes of the subject invention may be derived
from any of the nucleotide sequences SEQ ID NO:1-739. Because the corresponding
gene is only expressed in a limited number of tissues, a hybridization probe derived from

25　of any of the nucleotide sequences SEQ ID NO:1-739 can be used as an indicator of the
presence of RNA of cell type of such a tissue in a sample.

　　　　Any suitable hybridization technique can be employed, such as, for example, in
situ hybridization. PCR as described in US Patents Nos. 4,683,195 and 4,965,188
provides additional uses for oligonucleotides based upon the nucleotide sequences. Such

30　probes used in PCR may be of recombinant origin, may be chemically synthesized, or a
mixture of both. The probe will comprise a discrete nucleotide sequence for the detection

110

of identical sequences or a degenerate pool of possible sequences for identification of closely related genomic sequences.

Other means for producing specific hybridization probes for nucleic acids include the cloning of nucleic acid sequences into vectors for the production of mRNA probes.

5   Such vectors are known in the art and are commercially available and may be used to synthesize RNA probes *in vitro* by means of the addition of the appropriate RNA polymerase as T7 or SP6 RNA polymerase and the appropriate radioactively labeled nucleotides. The nucleotide sequences may be used to construct hybridization probes for mapping their respective genomic sequences. The nucleotide sequence provided herein

10   may be mapped to a chromosome or specific regions of a chromosome using well known genetic and/or chromosomal mapping techniques. These techniques include in situ hybridization, linkage analysis against known chromosomal markers, hybridization screening with libraries or flow-sorted chromosomal preparations specific to known chromosomes, and the like. The technique of fluorescent in situ hybridization of

15   chromosome spreads has been described, among other places, in Verma et al (1988) Human Chromosomes: A Manual of Basic Techniques, Pergamon Press, New York NY.

Fluorescent *in situ* hybridization of chromosomal preparations and other physical chromosome mapping techniques may be correlated with additional genetic map data. Examples of genetic map data can be found in the 1994 Genome Issue of Science

20   (265:1981f). Correlation between the location of a nucleic acid on a physical chromosomal map and a specific disease (or predisposition to a specific disease) may help delimit the region of DNA associated with that genetic disease. The nucleotide sequences of the subject invention may be used to detect differences in gene sequences between normal, carrier or affected individuals.

25   **4.20   PREPARATION OF SUPPORT BOUND OLIGONUCLEOTIDES**

Oligonucleotides, i.e., small nucleic acid segments, may be readily prepared by, for example, directly synthesizing the oligonucleotide by chemical means, as is commonly practiced using an automated oligonucleotide synthesizer.

Support bound oligonucleotides may be prepared by any of the methods known to

30   those of skill in the art using any suitable support such as glass, polystyrene or Teflon. One strategy is to precisely spot oligonucleotides synthesized by standard synthesizers.

Immobilization can be achieved using passive adsorption (Inouye & Hondo, (1990) J. Clin. Microbiol. 28(6) 1469-72); using UV light (Nagata *et al.*, 1985; Dahlen *et al.*, 1987; Morrissey & Collins, (1989) Mol. Cell Probes 3(2) 189-207) or by covalent binding of base modified DNA (Keller *et al.*, 1988; 1989); all references being specifically incorporated herein.

Another strategy that may be employed is the use of the strong biotin-streptavidin interaction as a linker. For example, Broude *et al.* (1994) Proc. Natl. Acad. Sci. USA 91(8) 3072-6, describe the use of biotinylated probes, although these are duplex probes, that are immobilized on streptavidin-coated magnetic beads. Streptavidin-coated beads may be purchased from Dynal, Oslo. Of course, this same linking chemistry is applicable to coating any surface with streptavidin. Biotinylated probes may be purchased from various sources, such as, e.g., Operon Technologies (Alameda, CA).

Nunc Laboratories (Naperville, IL) is also selling suitable material that could be used. Nunc Laboratories have developed a method by which DNA can be covalently bound to the microwell surface termed Covalink NH. CovaLink NH is a polystyrene surface grafted with secondary amino groups (>NH) that serve as bridge-heads for further covalent coupling. CovaLink Modules may be purchased from Nunc Laboratories. DNA molecules may be bound to CovaLink exclusively at the 5'-end by a phosphoramidate bond, allowing immobilization of more than 1 pmol of DNA (Rasmussen *et al.*, (1991) Anal. Biochem. 198(1) 138-42).

The use of CovaLink NH strips for covalent binding of DNA molecules at the 5'-end has been described (Rasmussen et al., (1991). In this technology, a phosphoramidate bond is employed (Chu et al., (1983) Nucleic Acids Res. 11(8) 6513-29). This is beneficial as immobilization using only a single covalent bond is preferred. The phosphoramidate bond joins the DNA to the CovaLink NH secondary amino groups that are positioned at the end of spacer arms covalently grafted onto the polystyrene surface through a 2 nm long spacer arm. To link an oligonucleotide to CovaLink NH via an phosphoramidate bond, the oligonucleotide terminus must have a 5'-end phosphate group. It is, perhaps, even possible for biotin to be covalently bound to CovaLink and then streptavidin used to bind the probes.

More specifically, the linkage method includes dissolving DNA in water (7.5 ng/ul) and denaturing for 10 min. at 95°C and cooling on ice for 10 min. Ice-cold 0.1 M

1-methylimidazole, pH 7.0 (1-MeIm7), is then added to a final concentration of 10 mM 1-MeIm7. A ss DNA solution is then dispensed into CovaLink NH strips (75 ul/well) standing on ice.

Carbodiimide 0.2 M 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide (EDC),
5   dissolved in 10 mM 1-MeIm7, is made fresh and 25 ul added per well. The strips are incubated for 5 hours at 50°C. After incubation the strips are washed using, e.g., Nunc-Immuno Wash; first the wells are washed 3 times, then they are soaked with washing solution for 5 min., and finally they are washed 3 times (where in the washing solution is 0.4 N NaOH, 0.25% SDS heated to 50°C).

10 .   It is contemplated that a further suitable method for use with the present invention is that described in PCT Patent Application WO 90/03382 (Southern & Maskos), incorporated herein by reference. This method of preparing an oligonucleotide bound to a support involves attaching a nucleoside 3'-reagent through the phosphate group by a covalent phosphodiester link to aliphatic hydroxyl groups carried by the support. The
15   oligonucleotide is then synthesized on the supported nucleoside and protecting groups removed from the synthetic oligonucleotide chain under standard conditions that do not cleave the oligonucleotide from the support. Suitable reagents include nucleoside phosphoramidite and nucleoside hydrogen phosphorate.

An on-chip strategy for the preparation of DNA probe for the preparation of DNA
20   probe arrays may be employed. For example, addressable laser-activated photodeprotection may be employed in the chemical synthesis of oligonucleotides directly on a glass surface, as described by Fodor *et al.* (1991) Science 251(4995) 767-73, incorporated herein by reference. Probes may also be immobilized on nylon supports as described by Van Ness *et al.* (1991) Nucleic Acids Res. 19(12) 3345-50; or linked to Teflon using the method of
25   Duncan & Cavalier (1988) Anal. Biochem. 169(1) 104-8; all references being specifically incorporated herein.

To link an oligonucleotide to a nylon support, as described by Van Ness *et al.* (1991), requires activation of the nylon surface via alkylation and selective activation of the 5'-amine of oligonucleotides with cyanuric chloride.

30   One particular way to prepare support bound oligonucleotides is to utilize the light-generated synthesis described by Pease *et al.,* (1994) PNAS USA 91(11) 5022-6,

incorporated herein by reference). These authors used current photolithographic techniques to generate arrays of immobilized oligonucleotide probes (DNA chips). These methods, in which light is used to direct the synthesis of oligonucleotide probes in high-density, miniaturized arrays, utilize photolabile 5'-protected N-acyl-deoxynucleoside

5   phosphoramidites, surface linker chemistry and versatile combinatorial synthesis strategies. A matrix of 256 spatially defined oligonucleotide probes may be generated in this manner.

4.21   PREPARATION OF NUCLEIC ACID FRAGMENTS

The nucleic acids may be obtained from any appropriate source, such as cDNAs, genomic DNA, chromosomal DNA, microdissected chromosome bands, cosmid or YAC

10   inserts, and RNA, including mRNA without any amplification steps. For example, Sambrook *et al.* (1989) describes three protocols for the isolation of high molecular weight DNA from mammalian cells (p. 9.14-9.23).

DNA fragments may be prepared as clones in M13, plasmid or lambda vectors and/or prepared directly from genomic DNA or cDNA by PCR or other amplification

15   methods. Samples may be prepared or dispensed in multiwell plates. About 100-1000 ng of DNA samples may be prepared in 2-500 ml of final volume.

The nucleic acids would then be fragmented by any of the methods known to those of skill in the art including, for example, using restriction enzymes as described at 9.24-9.28 of Sambrook *et al.* (1989), shearing by ultrasound and NaOH treatment.

20   Low pressure shearing is also appropriate, as described by Schriefer *et al.* (1990) Nucleic Acids Res. 18(24) 7455-6, incorporated herein by reference). In this method, DNA samples are passed through a small French pressure cell at a variety of low to intermediate pressures. A lever device allows controlled application of low to intermediate pressures to the cell. The results of these studies indicate that low-pressure shearing is a useful

25   alternative to sonic and enzymatic DNA fragmentation methods.

One particularly suitable way for fragmenting DNA is contemplated to be that using the two base recognition endonuclease, CviJI, described by Fitzgerald *et al.* (1992) Nucleic Acids Res. 20(14) 3753-62. These authors described an approach for the rapid fragmentation and fractionation of DNA into particular sizes that they contemplated to be

30   suitable for shotgun cloning and sequencing.

The restriction endonuclease *Cvi*JI normally cleaves the recognition sequence PuGCPy between the G and C to leave blunt ends. Atypical reaction conditions, which alter the specificity of this enzyme (*Cvi*JI**), yield a quasi-random distribution of DNA fragments form the small molecule pUC19 (2688 base pairs). Fitzgerald *et al.* (1992) quantitatively evaluated the randomness of this fragmentation strategy, using a *Cvi*JI** digest of pUC19 that was size fractionated by a rapid gel filtration method and directly ligated, without end repair, to a lac Z minus M13 cloning vector. Sequence analysis of 76 clones showed that *Cvi*JI** restricts pyGCPy and PuGCPu, in addition to PuGCPy sites, and that new sequence data is accumulated at a rate consistent with random fragmentation.

As reported in the literature, advantages of this approach compared to sonication and agarose gel fractionation include: smaller amounts of DNA are required (0.2-0.5 ug instead of 2-5 ug); and fewer steps are involved (no preligation, end repair, chemical extraction, or agarose gel electrophoresis and elution are needed

Irrespective of the manner in which the nucleic acid fragments are obtained or prepared, it is important to denature the DNA to give single stranded pieces available for hybridization. This is achieved by incubating the DNA solution for 2-5 minutes at 80-90°C. The solution is then cooled quickly to 2°C to prevent renaturation of the DNA fragments before they are contacted with the chip. Phosphate groups must also be removed from genomic DNA by methods known in the art.

4.22   PREPARATION OF DNA ARRAYS

Arrays may be prepared by spotting DNA samples on a support such as a nylon membrane. Spotting may be performed by using arrays of metal pins (the positions of which correspond to an array of wells in a microtiter plate) to repeated by transfer of about 20 nl of a DNA solution to a nylon membrane. By offset printing, a density of dots higher than the density of the wells is achieved. One to 25 dots may be accommodated in 1 mm^2, depending on the type of label used. By avoiding spotting in some preselected number of rows and columns, separate subsets (subarrays) may be formed. Samples in one subarray may be the same genomic segment of DNA (or the same gene) from different individuals, or may be different, overlapped genomic clones. Each of the subarrays may represent replica spotting of the same samples. In one example, a selected gene segment may be amplified from 64 patients. For each patient, the amplified gene segment may be in one 96-well plate

(all 96 wells containing the same sample). A plate for each of the 64 patients is prepared. By using a 96-pin device, all samples may be spotted on one 8 x 12 cm membrane. Subarrays may contain 64 samples, one from each patient. Where the 96 subarrays are identical, the dot span may be 1 mm^2 and there may be a 1 mm space between subarrays.

5   Another approach is to use membranes or plates (available from NUNC, Naperville, Illinois) which may be partitioned by physical spacers e.g. a plastic grid molded over the membrane, the grid being similar to the sort of membrane applied to the bottom of multiwell plates, or hydrophobic strips. A fixed physical spacer is not preferred for imaging by exposure to flat phosphor-storage screens or x-ray films.

10   The present invention is illustrated in the following examples. Upon consideration of the present disclosure, one of skill in the art will appreciate that many other embodiments and variations may be made in the scope of the present invention. Accordingly, it is intended that the broader aspects of the present invention not be limited to the disclosure of the following examples. The present invention is not to be limited in scope by the

15   exemplified embodiments which are intended as illustrations of single aspects of the invention, and compositions and methods which are functionally equivalent are within the scope of the invention. Indeed, numerous modifications and variations in the practice of the invention are expected to occur to those skilled in the art upon consideration of the present preferred embodiments. Consequently, the only limitations which should be placed upon

20   the scope of the invention are those which appear in the appended claims.

All references cited within the body of the instant specification are hereby incorporated by reference in their entirety.

5.0   EXAMPLES

5.1   EXAMPLE 1

25   Novel Nucleic Acid Sequences Obtained From Various Libraries

A plurality of novel nucleic acids were obtained from cDNA libraries prepared from various human tissues and in some cases isolated from a genomic library derived from human chromosome using standard PCR, SBH sequence signature analysis and Sanger sequencing techniques. The inserts of the library were amplified with PCR using primers

30   specific for the vector sequences which flank the inserts. Clones from cDNA libraries were

spotted on nylon membrane filters and screened with oligonucleotide probes (e.g., 7-mers) to obtain signature sequences. The clones were clustered into groups of similar or identical sequences. Representative clones were selected for sequencing.

In some cases, the 5' sequence of the amplified inserts was then deduced using a

5   typical Sanger sequencing protocol. PCR products were purified and subjected to fluorescent dye terminator cycle sequencing. Single pass gel sequencing was done using a 377 Applied Biosystems (ABI) sequencer to obtain the novel nucleic acid sequences. In some cases RACE (Random Amplification of cDNA Ends) was performed to further extend the sequence in the 5' direction.

10

5.2   **EXAMPLE 2**

Novel Contigs   .

The novel contigs of the invention were assembled from sequences that were obtained from a cDNA library by methods described in Example 1 above, and in some cases

15   sequences obtained from one or more public databases. Chromatograms were base called and assembled using a software suite from University of Washington, Seattle containing three applications designated PHRED, PHRAP, and CONSED. The sequences for the resulting nucleic acid contigs are designated as SEQ ID NO: 1-739 and are provided in the attached Sequence Listing. The contigs were assembled using an EST sequence as a seed.

20   Then a recursive algorithm was used to extend the seed EST into an extended assemblage, by pulling additional sequences from different databases (i.e., Hyseq's database containing EST sequences, dbEST version 120, gb pri 120, UniGene version 120, and Genpept 120) that belong to this assemblage. The algorithm terminated when there was no additional sequences from the above databases that would extend the assemblage. Inclusion of

25   component sequences into the assemblage was based on a BLASTN hit to the extending assemblage with BLAST score greater than 300 and percent identity greater than 95%.

The nearest neighbor result for the assembled contig was obtained by a FASTA version 3 search against Genpept release 120, using FASTXY algorithm. FASTXY is an improved version of FASTA alignment which allows in-codon frame shifts. The nearest

30   neighbor result showed the closest homologue for each assemblage from Genpept (and

contains the translated amino acid sequences for which the assemblage encodes). The nearest neighbor results for SEQ ID NO: 1-739 are shown in Table 2.
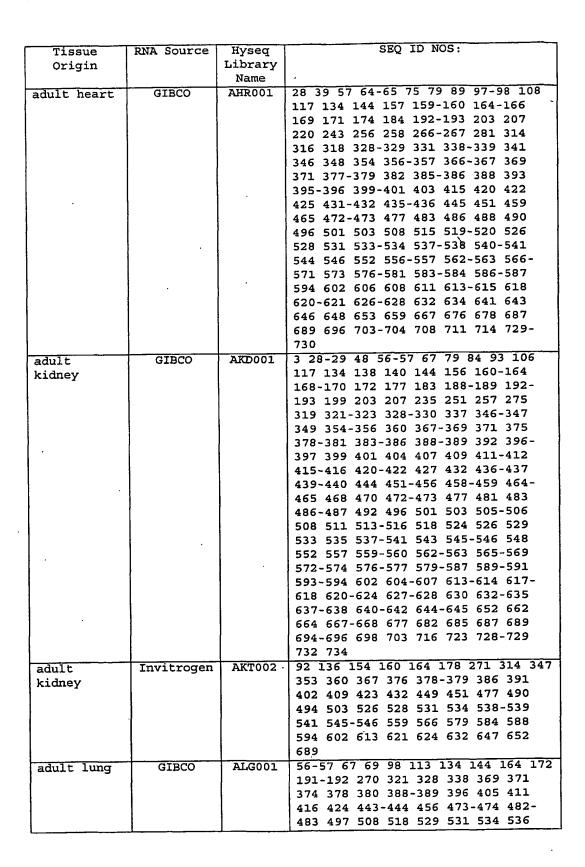
Tables 1, 2, and 3 follow. Table 1 shows the various tissue sources of SEQ ID NO: 1-739. Table 2 shows the nearest neighbor result for the assembled contig. The nearest

5 neighbor result shows the closest homologue for each assemblage and contains the translated amino acid sequences for which the assemblage encodes. Table 2 also shows homologues with identifiable functions for SEQ ID NO: 1-739. The polypeptides were predicted using a software program called FASTY (available from http://fasta.bioch.virginia.edu) which selects a polypeptide based on a comparison of

10 translated novel polynucleotides to known polynucleotides (W.R. Pearson, Methods in Enzymology, Vol. 183: pp. 63-98, (1990), herein incorporated by reference). Table 3 shows the predicted amino acid sequence corresponding to the novel nucleic acid contig sequences.

Table 1 - Tissue Sources

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
adult brain	GIBCO	AB3001	28 46 54 62 95 117 134 175 188-189 324 330 337 356 369 371 378 386 389 396 432 435-436 468 472-473 476-477 483 486 518 538-539 543 545 557 565 571 573 578 582 598 613-614 619 627 632 634 639 687 709
adult brain	GIBCO	ABD003	5 12 46 52 57 66 79 91 97 134 144 148 150 162 164 172 175-176 181 186 193 250 323 325-327 330 334 338 362 367 369 371 378-379 386 388-389 392 396-397 399-401 403 416 422 435 444 449 451 454 461 463-464 468 472-473 483 486 494 506 511 513 516 520 523-524 526 529 533 536-537 539 545 548 552 556 558-559 562-563 565 567 569 573-574 576 579-580 582-584 590 593-594 598 602 606 613-614 619-621 623-624 627 634 637 641 646 648 659 675 688-689 694 696-698 703 714 729
adult brain	Clontech	ABR001	57 162 164 227 266 316 334 356 367 385 438 468 512 524 528 557 582 590 621 627 631 634 689 714
adult brain	Clontech	ABR006	189 228 385 438 571 584 632 650 677
adult brain	Clontech	ABR008	1 3 5 11-25 31-32 46-47 55-57 59

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			61 65-67 69 75 79 91 103 108 111 113-114 126 132 150 160 162 164 171-172 186 188-189 193 202-203 206 210-212 220 222-224 227-229 233 235-236 243-247 251-252 257 264-266 268 275 313 324 328-331 334-335 338-339 343 346-347 351 355 357 359-361 365 367 370-371 378 380 382 386-389 391 396 399-400 402 406 413 419-420 423 426 432 434 437-438 442 446 448-449 459-460 465 468 470 472-473 475 481-483 487 489-490 495-497 499 501 503-504 507-509 511 520 524 526 528 532-533 536 539-540 543-546 551-552 556-557 563 565-567 569 572-573 576-577 579-580 582 584 586 590-591 593 595-597 599-602 604 610-616 620-621 624-625 627-628 632 634 637-638 641 643-644 646-647 650 653-657 660-662 668 672 675 677-678 680-681 688-689 691 693 695-696 698 706-707 709 711 713-727 729 731 733-734 736 738-739
adult brain	Clontech	ABR011	334 476 634 677
adult brain	BioChain	ABR012	379 587
adult brain	Invitrogen	ABR013	334 634
adult brain	Invitrogen	ABT004	3 19 57 62 66 75 110 122 150 160 162 167 171 176 186 197 203 211 230 232 259 328-331 334 369 382 389 394 400 406 417 426 429 442 457 472 483-484 492 511 514 529 531 534 537 540 553 558 562 572 580 582-584 590 604 611 613 615 622 637 639 643-644 648 688-689 692 695
cultured preadipo-cytes	Strategene	ADP001	16 37-39 66 109 120 141 144 193 273 316 331 333 338 389 415 429 442 444 464-465 475 489 501 511 513 531 534 539-540 545-546 557 583-584 590 596 602 607 613 615 619 622 629 632 634 643
adrenal gland	Clontech	ADR002	4-5 12 48 53 57 162 164 172 186 188 192 196 203 207 213 258 316 330-331 333 339 354 356-357 369 383 385 388 392 395 402 406 411 415 434 454-455 465 468 473 475 477 491 498 501 509 511 517 528-529 532 537-539 542 545 558 560 565 567 576-577 586 600 606 615 621 624 627 632 634 647 653 660 667 683 689 696 714

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
adult heart	GIBCO	AHR001	28 39 57 64-65 75 79 89 97-98 108 117 134 144 157 159-160 164-166 169 171 174 184 192-193 203 207 220 243 256 258 266-267 281 314 316 318 328-329 331 338-339 341 346 348 354 356-357 366-367 369 371 377-379 382 385-386 388 393 395-396 399-401 403 415 420 422 425 431-432 435-436 445 451 459 465 472-473 477 483 486 488 490 496 501 503 508 515 519-520 526 528 531 533-534 537-538 540-541 544 546 552 556-557 562-563 566-571 573 576-581 583-584 586-587 594 602 606 608 611 613-615 618 620-621 626-628 632 634 641 643 646 648 653 659 667 676 678 687 689 696 703-704 708 711 714 729-730
adult kidney	GIBCO	AKD001	3 28-29 48 56-57 67 79 84 93 106 117 134 138 140 144 156 160-164 168-170 172 177 183 188-189 192-193 199 203 207 235 251 257 275 319 321-323 328-330 337 346-347 349 354-356 360 367-369 371 375 378-381 383-386 388-389 392 396-397 399 401 404 407 409 411-412 415-416 420-422 427 432 436-437 439-440 444 451-456 458-459 464-465 468 470 472-473 477 481 483 486-487 492 496 501 503 505-506 508 511 513-516 518 524 526 529 533 535 537-541 543 545-546 548 552 557 559-560 562-563 565-569 572-574 576-577 579-587 589-591 593-594 602 604-607 613-614 617-618 620-624 627-628 630 632-635 637-638 640-642 644-645 652 662 664 667-668 677 682 685 687 689 694-696 698 703 716 723 728-729 732 734
adult kidney	Invitrogen	AKT002	92 136 154 160 164 178 271 314 347 353 360 367 376 378-379 386 391 402 409 423 432 449 451 477 490 494 503 526 528 531 534 538-539 541 545-546 559 566 579 584 588 594 602 613 621 624 632 647 652 689
adult lung	GIBCO	ALG001	56-57 67 69 98 113 134 144 164 172 191-192 270 321 328 338 369 371 374 378 380 388-389 396 405 411 416 424 443-444 456 473-474 482-483 497 508 518 529 531 534 536

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			540 552 556 559 563 568 573 579- 580 585-586 588-589 593 601-602 606 612-613 618 634 662 667 685 696 702 726 729-730
lymph node	Clontech	ALN001	28 57 79 113 164 172 179 193 240 325 332 367 378-379 386 388 402 485 526 580 586 603 613-614 621- 622 628 634 662 667 686 734
young liver	GIBCO	ALV001	3 24 28 54 60 117 134 137 154 160 193 196 242 273 316 328-329 334 351 354 370-371 388 392 395-396 401 406 411 415 432 435 439 448 454-455 477 483 486-487 495 506 509 514 518 523-524 526 529 531 534 537-538 540 544 548 566 568 571 573 579 587-588 591 594 602 621 641 645 686 713 723
adult liver	Invitrogen	ALV002	3 24 27 56-57 65-66 71 79 92 97 106 134 140 164 192 200 214 220 232 240 242 271-272 291 313 316 328 347 349-350 353 355 357 368- 369 371-372 378-379 381-382 385 397 430 435 448 457 459 471-472 475 485 487 502 505-506 511 520 530-531 533-534 537 540-541 543 548 566 574-575 579 582 588 590 612 623 640 648-649 681 687 689 710 714
adult ovary	Invitrogen	AOV001	3 10 14 28 54 56-58 62 65-66 68 73 75 79 98 127 144 154 162 164-165 172-174 182 186 188-189 192-196 206 213 224 234-235 241 243 248 253 261 273 275 289 314 316 321- 322 325-327 329-331 333-334 336- 338 340 343 345-348 354-357 367 369 371-372 378 382 386 388 395- 397 399-402 404 407 411 415-416 419-420 425 427 429 431 435-437 441 444 451 453-459 465 468-470 472-475 481 485 490 494 496 501 503 509-510 513 517-518 522-524 526 528-529 531-534 537-542 545- 546 548 552 554 556-557 559-560 562-563 565 567-569 572-579 581- 582 584-588 590-591 593-598 602- 604 606 611-615 618 620-623 627 629 631-632 635-638 643 647 652- 654 657 659 661-662 667 674-675 677-678 682 684 689 693 695-698 703 705-707 714 717-718 723 729 731 738
adult placenta	Clontech	APL001	172 224 239 363 371 392 437 531 534 622 690 696

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
placenta	Invitrogen	APL002	57 66 122 161 172 241 326 329 334 369 388 407 427 429 436 459 464 506 508 511 539 541 545 566 573 575 590 597 637 648 690
adult spleen	GIBCO	ASP001	28 57 65 78 93 95 117 134 156-157 172 186 188 194 214 273 314 319 331 334 338 344 354 371 374 392 436 457 471-473 478-479 481 483 515 526 528-529 541 548 557 559 563 565 569 573 585-587 603 606 613 615 618 621-622 627 632 634 637 643 654 671 689 696-698 701 712 739
testis	GIBCO	ATS001	3 67 134 160 192 235 327 329 337 342 371 375 378 380-381 396 399 415 431 436 441 451 472 477-478 483 486 494 496 503 522 524 526 531 533-534 538 541-542 546 548 557 568 573 577 579 581 584 594 596 618 641 658 662 689 700 714 729-730
adult bladder	Invitrogen	BLD001	28 57 112 161 164 172 192 194 250 334 354 370 397 404 487 513 526 531 534 545 572 599 602 620 634 651 659 672 689 713 725
bone marrow	Clontech	BMD001	10-11 28 31 54 57 62 75 78-83 88 131-133 135-137 141-143 157 159 164 171-173 176-177 187-189 192 195 200 202 205 207 218 225 282 314-318 325 330 334-335 337 346- 348 367 369 372 378 383 386 388 395 401 405 412-413 416 422 436 442-443 447 449 455 465 472 475 477 503 516 523 528-529 533-534 539 545 551 556 559 563 565-567 571 573-574 576 579-586 594 601- 602 606 613, 620-623 628-629 634 638 642-643 646 656 659 666 686 689 691 696 698-699 703 705 714 720 726 729
bone marrow	Clontech	BMD002	2 15 23 35 49 54 57 59 78 81 114 156-157 164 171-172 189-190 202 223 240 325 334 346 357 367 379 381-382 388 397 412 454 465 482 490 509 516 526 535 537 563 566 579 595 600 638 640-641 654-655 676 689 714
adult colon	Invitrogen	CLN001	48. 79 94 138 162 167 189 333 368- 369 375 386 404 409 414 435-436 455 470 525 541 548 553 567 603 634 656 659 689 694 721
adult cervix	BioChain	CVX001	3 28 35 54 57 79 83 95 97 113 117 154 162 164 172 176 220 235 248-

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			249 321 327 329 333 338 346 348 354 356 362 367-368 371 374-375 378-379 386 388-389 395 401-402 404 407 420 429 431 437 443 451 459 468 475 477 479 483 485 490 493-494 496 506 508 511 517 526 528 531 534 544 550 552 559 566 569 571-573 575-576 581-583 588 590 593-594 604 606 614 622 628 631-635 639 661-662 675 689 692 695 715 718 738
endothelial cells	Strategene	EDT001	3 28 31 39 54 58 65-66 79 89 144 160 173 187 189 191 193 197-199 207 220 230 267 273 314 324 326 329-331 336 347 354 369 372 378-379 384 386 388 391-394 396-397 399 401 407 420 422 429 431-432 435-437 444 449 451 455 459 465 472 474-475 481-482 486 490 499-501 503 506 511 513 515-517 520 522-524 528 531-534 538-539 541 545-546 548 550 552 557 559-560 563 565 567 569 571 573 577 579-580 583-584 587-590 593-594 596-597 599 602 611 614-615 618 620-621 624 630 632-634 637-638 642-643 647-648 651 675 677 680 682 694 696-698 703 708 714 719 724-725 728-730 734
Genomic clones from the short arm of chromosome 8	Genomic DNA from Genetic Research	EPM001	38 41-45 118-121 164 198 292-312
Genomic clones from the short arm of chromosome 8	Genomic DNA from Genetic Research	EPM003	43 164 295
Genomic clones from the short arm of chromosome 8	Genomic DNA from Genetic Research	EPM004	121 164 306 482
Genomic clones from the short arm of chromosome 8	Genomic DNA from Genetic Research	EPM006	293

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
esophagus	BioChain	ESO002	513 526
fetal brain	Clontech	FBR001	57 468 563 634
fetal brain	Clontech	FBR004	162 186 254 265 491 582
fetal brain	Clontech	FBR006	1-2 5-6 11-12 22-23 49 57 62 73 94 103 114 162 164 172 189 193 203 218 240 244 251-252 259 279 330-331 334-335 346-347 351 367 378 386 388-389 399 413 420 422 424 434 442 444 448 465 468 470 472-473 490 496 501 503-504 511 520 524 528 532-533 539 544-546 548 551 553 563 571 573 576 587 591 601 613 615-616 620-621 628 634 641 644 648 653 657 662 672-673 689 691 698 706 714 718 725-728 733 735-739
fetal brain	Clontech	FBRs03	444 587
fetal brain	Invitrogen	FBT002	17 66 157 162 164 186 190 193 250 270 324 331 334-335 338 346 354-355 374 382 389-390 426 429-430 437 442 453 467 471 475 481 485 491 507-508 513-514 526 528 532 540 544 548 550 552-553 557-558 563 565-566 590 593 602 612 615 637 641 648 654 662 672 676 692 703
fetal heart	Invitrogen	FHR001	57 75 164 547
fetal kidney	Clontech	FKD001	57 164 172 179 188 194 208 218 230 240 250 330 334 369 388 401 413 439 454 465 529 546 550 573 576 581 583 594-596 602 634 648 667 676 689 698 706
fetal kidney	Clontech	FKD002	2 560
fetal kidney	Invitrogen	FKD007	565 596-597
fetal lung	Clontech	FLG001	75 164 355 386 428 455 513 524 528 631 689
fetal lung	Invitrogen	FLG003	30 157 162 169 188 243 253 256 283 330 392 400-401 404 407 424 428 435-436 479 506 508 520 530-531 534 572 578 584 602 611 613 631 654 658 662 676 689 701 716
fetal lung	Clontech	FLG004	371
fetal liver-spleen	Columbia University	FLS001	2-3 5 26 29 31 35 48 54-58 60 62 65 67 70 74-77 79-80 84-87 89 92 96 98-100 104 117 122-130 138 140 144-158 160 162 164 172-173 185-186 188-189 192-194 196 199-200 207 214 218-219 237-238 241 269 273 280 282 314-316 318-322 324 327 329-331 334-335 337 340 345 348-350 354-358 363-364 367-371

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			373 375 377-380 382-383 385-386 388 394-396 399 402 409 411-412 418 420-422 424 427 431 435-437 440 442 448-451 453 455 459 461 464-465 470 472-473 475 477-478 480-485 488-490 501 503 505-506 509 511-513 515-518 520 522-524 526-534 538-539 541 543-547 549- 550 552-553 556-557 559-564 566- 567 569 571 573 576 578-580 582- 587 589 591-594 596-597 599-600 602 611-615 618 620-625 627-628 631-636 638 641-642 646 648 651 659-660 662-664 667-668 675-678 680-681 684 689-690 696-698 709 714 723 738
fetal liver- spleen	Columbia University	FLS002	15 31-32 39-40 47-49 52 56 60 65 69 72 75 78 84 97-98 100 104 115 123 138 140 144 146 152-153 157 161 164 172-173 182 188 194 196 199 220 241-242 246 249 253 255 266 273-275 280-281 288-291 314- 316 318-319 321-322 324 329-331 336-339 343 347-350 353-354 357- 358 363 367 369-370 372 374 378- 380 382-383 386 388-389 393-397 399 405 407 409-410 412 421 424 432 435 439 448 450-451 453-457 459 461 464-465 470 472-475 477 479-481 483 485 488 490 497 501 503 506 509 511-513 516-518 520 524 527-528 531-532 534 539 541- 546 556 559-560 565-566 569 571 574 576 579 582-586 588 590 597- 599 602-604 606 615 618 620-621 623 625 627 632-634 639 641 644 648 666-668 675-676 681 684 689- 690 696-697 701 703 714 719 723 734-735
fetal liver- spleen	Columbia University	FLS003	60 79 157 190 690
fetal liver	Invitrogen	FLV001	3 27 35 48 50 56-57 66 75 92 94 105 157 161 164 176 189 209 220 243 272 324 328 333 335 353 369- 370 381 392 396 429-430 435 439- 440 442 444 465 471 483 487 502 506 513-514 519 534-535 537 548 554 566 568 576-577 580 582 590 613 621 645 648-649 689
fetal liver	Clontech	FLV002	343
fetal muscle	Invitrogen	FMS001	51 79 97 108-110 166 194 196 266 341 352 380 389 402 407 444 464

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			475 501 513 524 546 552 554 560 570 572 598 605 628 634 649 675 703-704 714 737
fetal muscle	Invitrogen	FMS002	524
fetal skin	Invitrogen	FSK001	31 33 35 48 57 63 67 75 112-114 117 157 162 164 172 178 180 188 196 220 243 254 319 324 328 330 333-334 367 369 371 375 379-383 386 388-389 400 404 407 412 419- 420 429 444 455 472-473 491 499 503 508 511 514 517 522-524 529 531 534 537 540 542 547 552 554 556-557 560 563 565 567 571-572 574 576 579 590 596 599 616 621 625 627 631-632 634 639-640 648 653-654 662 689 708 714
fetal skin	Invitrogen	FSK002	501 537
fetal spleen	BioChain	FSP001	465 729
umbilical cord	BioChain	FUC001	27-28 35 57 68 83 105 136 157 159- 160 164 188 191 225 279 315-316 321 328 334 363 367 369 378-379 383 386 388-389 392 397 406-407 413 415-416 427 440 449 455 458 461 464-465 468 473-475 479 485- 486 488 490 496 514 517 522 524 526 528-529 531 533-534 538 540 546 550 552 556-558 572 582 584- 585 587-588 594-597 602 606 613 616 618-619 631 634 637 651 689 696 698 706 729
fetal brain	GIBCO	HFB001	3 5 22 26 46 53 66 73 94 117 134 139 164 172-173 188-189 212 215 230-231 248 251 262 288-289 316 325 329-331 334 337-338 348 352 365-367 369 371 377-379 385-386 388 392 394 396 400 403 420 422 429 437 444-446 449 451 455 459 461-463 466-468 472-473 475 477 481 483 485-486 488 490-491 496 503-504 506 513 523-524 529 532- 533 539-541 545 548 550 552 557- 560 563 565-566 569 571 576-577 579-580 583-584 586 590 593-594 596-599 601-602 604 606 611 613 615 618 621-623 627-628 634-635 637 641 643 647 662 664-665 667 675 677 680 689 695-697 703 726
macrophage	Invitrogen	HMP001	97 518 532 569
infant brain	Columbia University	IB2002	28 46 56-57 59 67 75 78 109 117 122 129 144 157 162 164-165 172 176 180 190 193 212 220 226 236-

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			237 251 261-262 316 318 324 328-330 334-335 337 340 354-356 361 364-365 367 369 371-373 377-380 382 385-386 389 392 395 397 400 411 416 421-422 429 432 436 438 444 448 451 456 464-465 469 471-475 484 486 496 504-506 511 520 524 526 529 531 533-534 537-540 544-546 548 553 556 558 562 565 567 576 579-580 582 584 586 589-590 593 597-598 602 613-614 618 620-621 627-628 632 634 636 641 650 654 659 662 667 683 689 721 730
infant brain	Columbia University	IB2003	46 54 75 109 156 164 220 244 251 314 324-325 331 335 340 361-362 367 369 377-379 400 408 438 442 456 460 464 469 472 496 506 523-524 526 529 538 540 544-545 547 558 560-562 565 567 569 579 584 598 602 613 615 621 627 632 634 637 639 650 738
infant brain	Columbia University	IBM002	262 340 432 436 438 472 531 534 569 613 634
infant brain	Columbia University	IBS001	162 231 283 331 369 385 438 444 472 506 513 523 531 534 580 615 636 689
lung, fibroblast	Strategene	LFB001	28 54 57 65 172 188 233 321 331 340 347 367 369 378-379 388 401 451 459 475 479 503 511 522 524 532 534 559-560 573 580 583 587 597 615 632 634 638 686 689 708
lung tumor	Invitrogen	LGT002	3 7 21 24 26 28 31 54 56-57 62-63 66 92-93 101 109 112 162 164 171-172 176 183 188-189 192-193 196 201-202 223 230 235 259 273-274 316 321 329-331 333-334 338 345 347-348 356 367 369 371-372 378-379 381-382 386 388-390 396 399-404 406 409 416 424-425 427 429 432 436-437 439 451 455-456 459 464-465 467 473 475 484-486 490 499 502-503 506 508 511 513-514 517-518 522 524 526 528 531-532 534-535 538-539 541 543-546 553 557-559 563 567-568 571 573 575-576 579-580 585-588 590-591 593-594 598 601-604 609 611-613 615 621 627-628 631-632 636-637 645 648 651-652 654 662 667 672 677 681 683 689 698 701-702 714 718 724 726 729 734
lymphocytes	ATCC	LPC001	4 31-32 35 57 65-66 70 110 116 156

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			162 164 230 243 250 282 287 326 328-330 334 336 346-347 359 378 386 388 397 407 414 416 419 472 497 520 525 539 545 549 551 582 590 606 615 618 621 631 634 686 692 698 701 714
leukocyte	GIBCO	LUC001	4 7 9-11 23 28 31 35 39 54 65 75-76 79 90 97 110 117 134 152 157 159 162 164-167 171 173 176 188 193 199 204 207 220 244 253 255 314 316 318 321 324 326 329-330 337-339 346-347 352 354 356 367 369 371 378-379 382 388-389 392 396-397 400-402 405 415-416 420 422 429 432 435-436 443-444 449 454-455 457-459 465 479 481-486 491 497 501 503-504 506 508 511 514 516 520 523-525 529 532-533 535 538-539 545 548 552-554 556 559-560 562-563 565-566 569 571-573 576 579 581 585-587 590 593-594 598 600-602 604 606-609 613-614 618 620-622 624 627 630 632-634 636 638 643 645 660-662 667 678 682 684 686 689 691 693 696-698 714 726
leukocyte	Clontech	LUC003	11 54 97 152 164 330 479 546 564-565 593 613 627 634 646 696 729
melanoma from cell line ATCC #CRL 1424	Clontech	MEL004	2 57 67 79 164 171-173 188 193 196 232 321 337 341 346 367 379-380 388 407 427 454 472 477 482 501 520 539 545 552 556 579 588 593 598 611 621 631 648 665 714 730
mammary gland	Invitrogen	MMG001	3 20-21 29 31 54 56-57 63-66 79 94 109 112-113 117 122 125 138 141 154 160 162 164 172 176 186 189 192 204 214 220-221 232 238 251 255 257 273 276-278 324 326 328-331 333 335 337 341-343 347 354-355 357 367-371 374-375 379 382-386 388-392 397 399-400 404 406-408 410-411 425 431 435-436 444 451 455 457 459 461 464-465 470-471 475 479 483 485 487-488 491 501 506-508 511 513-519 523-524 526 529 531-532 534-535 537 539-540 542-545 552-554 557-560 563 566 569 572 577 580 584 587-588 590 597-598 602 604-605 609 611 613 615 624 627 631-634 637 639-640 643 648-649 654 664 669-670 672-673 676-679 681 689 691-695 697-698 706 714 731 734 737

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
induced neuron cells	Strategene	NTD001	36 57 164 284 388 397 420 481 485 501 524 528-529 539 542 545 560 571 579 582 595 602 620 637 654 667 689 730
retinoid acid induced neuronal cells	Strategene	NTR001	524 584 693
neuronal cells	Strategene	NTU001	36-38 120 204 331 351 354 357 386 388 399 411 442 459 516 533 539 545 565 586 606 615 621 637-638 642 646 648 714 730
placenta	Clontech	PLA003	503 579 690
prostate	Clontech	PRT001	15 40 65 164 187 207 229 337 348 367 375 377-378 395 406 416 428 458 468 476 511 524 526 531 534 538 555 559 563 576 584 597 613 622 624 631 642 667 672 677 684 724 734
rectum	Invitrogen	REC001	57 67 164 260 331 343 370-371 380 382 384 404 409 436 444 475 485 498 513 524 526 540 542 552 554 581 615 619 624 627 634 654 659 671 689 714
salivary gland	Clontech	SAL001	21 84 106-107 152 179 238 246 255 273 287 371 378 383 401 407 420 455 475 477 509 512 515 521 541 548 565 570-571 573-574 589 606 628 634 636 652 689 703 738
skin fibroblast	ATCC	SFB002	192
skin fibroblast	ATCC	SFB003	464
small intestine	Clontech	SIN001	57 66 71 98 116 150 164 172 327 336 343 362 367 379 388 397 401-402 417 429 433 436 496 526 528 533 590 602 620 631 634 667 678 711
skeletal muscle	Clontech	SKM001	3 57 66 101 164 172 256 266 325 379 385 449 468 485 487 518 552 554 566-567 570 582 584 590 606 611 628 631 738
spinal cord	Clontech	SPC001	10 54 57 66 75 100 102 114 144 164 175 193 199 215-216 325 334 337 367 370 380 385-386 406 411-413 419 429 466 470 486 518 526 529 531 534 574 579 585 587 590 604 620-621 631-632 634 642 644 648 659 688-689 691 693 695
adult spleen	Clontech	SPLc01	478 572
stomach	Clontech	STO001	26 90 164 218 358 369 386 468 475

Tissue Origin	RNA Source	Hyseq Library Name	SEQ ID NOS:
			485 526 532 569 576 579 581 586 603 631 634 677 682 689
thalamus	Clontech	THA002	17 31 57 66 109 127 164 217-218 262 315-316 324 330 357 369 386 388 400 406 435 456 459 464 468- 469 515-516 537 540-541 556 566 574 590 611 622 631 634 644 648 656 677-678 680
thymus	Clontech	THM001	6 15 26 54 79 164 172 187 193 201 264 291 315 329 331 351 356 367 397-398 401 407 412 424 427 429 435-436 443 451 474 478 482 549 563 565 567 569 576 578 581-582 610 615 621 631-632 634 648 662 667 669 679 689 693 696
thymus	Clontech	THMc02	3-6 8 11 16 18 34 58-59 67 132 149 162 164 167 172-173 186 188-189 193 200 203 216 223 232 239 255 263 265 319-320 331 333-334 355 359 370 373 377-380 382 387-390 393 395 398-399 402 404 408 420 427 434 436 467 475-476 503 508 518 524 526 532 540 560 563 565 571-572 576-577 579 582 598 601 603 612-613 615 621 627 632 634 639 641 648 651 657 659 662 672 677-678 684-686 689 696 699 706 714-716 722 726-729 732
thyroid gland	Clontech	THR001	5 29-30 40 54 57 66 72 79 117 144 160 164 166 170 172 176 183 188- 189 208-209 219 230 285-286 314 318 327 331 335 338 344 347 354 363 367 375 377-380 382 384-386 388 393 397 399 401-403 419 422 429 436 442 444 451 456 458-461 464 467-468 470 472-473 476-477 481 488 494 503 508-509 511 516 519-521 524 528-529 533 537-538 543 548 557 559-560 563 565-566 571-574 576 582 585 587 590-591 593-594 596-597 606 614-615 620- 621 623-624 627 631-634 640 650- 651 653 662 667 669-670 675 679 689 708 712 714
trachea	Clontech	TRC001	156 164 171 240 375 378 390 400 422 468 484 565 574 581 585 587 631 654 689 714
uterus	Clontech	UTR001	65. 77 79 101 164 220 367 369 451 468 526 530 533 548 554 559 562 568 573 582 594 637 648 689

Table 2 - Nearest Neighbor Results

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
1	1000	gi7021484	Mus musculus	secretory carrier membrane protein 4	567	85
2	10017	R06463	Homo sapiens	Derived protein of clone ICA13 (ATCC 40553).	848	100
3	10020	gi1065967	Caenorhabditis elegans	similar to other protein phosphatases 1, 2A and 2B	325	36
4	10024	G03460	Homo sapiens	Human secreted protein,	439	98
5	10032	Y12505	Homo sapiens	Human 5' EST secreted protein	136	87
6	10042	Y29511	Homo sapiens	Human lung tumour protein SAL-25 1st predicted amino acid sequence.	701	100
7	1006	Y92324	Homo sapiens	Human alpha-2-delta-D polypeptide from splice variant 1.	763	100
8	10064	gi4589375	Homo sapiens	Gab2	425	58
9	1007	gi7018398	Homo sapiens		151	75
10	1008	gi896065	Homo sapiens	protein that is immuno-reactive with anti-PTH polyclonal antibodies	1226	99
11	10088	gi3779244	Homo sapiens	Metallo-protease 1	1512	98
12	10089	gi2947232	Homo sapiens	membrane associated guanylate kinase 2	523	100
13	10091	gi3347863	Mus musculus	cAMP-specific cyclic	223	54

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				nucleotide phosphodi-esterase PDE8; MMPDE8		
14	10098	gi6979311	Homo sapiens	cysteine-rich repeat-containing protein S52 precursor	1068	100
15	10102	G01395	Homo sapiens	Human secreted protein,	297	88
16	10103	gi854733	Rattus norvegicus	casein kinase 1 gamma 1 isoform	293	84
17	10104	Y60017	Homo sapiens	Human endometrium tumour EST encoded protein 77.	154	100
18	10108	G03290	Homo sapiens	Human secreted protein,	215	97
19	10110	gi7292299	Drosophila melanogaster	CG1271 gene product	208	46
20	10111	gi4512334	Rattus norvegicus	Ca/calmodulin-dependent protein kinase kinase alpha, CaM-kinase kinase alpha	822	89
21	10113	Y41694	Homo sapiens	Human PRO382 protein sequence.	633	97
22	10114	gi349075	Rattus norvegicus	calmodulin-binding protein	531	99
23	10116	gi162981	Bos taurus	endozepine-related protein precursor	937	87
24	10121	gi8979743	Canis familiaris	Band4.1-like5 protein	643	100
25	10126	Y99420	Homo sapiens	Human PRO1486 (UNQ755) amino acid sequence	607	100
26	1013	gi804750	Homo sapiens	protein tyrosine	614	73

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				phosphatase		
27	10136	W02105	Homo sapiens	Human L-asparaginase.	1243	98
28	10142	Y35924	Homo sapiens	Extended human secreted protein sequence,	862	89
29	10148	gi3334982	Homo sapiens	R27216_1	329	98
30	1015	G02485	Homo sapiens	Human secreted protein,	120	72
31	10154	gi10798804	Homo sapiens	sperm antigen	2607	98
32	10175	Y96864	Homo sapiens	SEQ. ID. 37 from WO0034474.	536	100
33	10196	gi553621	Homo sapiens	profilaggrin	346	39
34	10198	gi1419016	Mus musculus	odorant receptor	281	53
35	10200	Y57903	Homo sapiens	Human transmembrane protein HTMPN-27.	448	100
36	10208	gi4062492	Escherichia coli		505	100
37	10212	gi8825529	Escherichia coli	ORF_f141	625	96
38	10213	gi4062778	Escherichia coli	Hypothetical protein HI0761	773	98
39	10214	gi6693832	Rattus norvegicus	opioid growth factor receptor	661	44
40	10227	G01360	Homo sapiens	Human secreted protein,	384	100
41	10236	gi1651257	Escherichia coli	.	373	100
42	10241	gi2769262	Escherichia coli	catabolite gene activator protein	178	96
43	10245	gi1789539	Escherichia coli	orf, hypothetical protein	679	98
44	10246	gi8824922	Escherichia coli	ORF_o179	488	97
45	10247	gi1742149	Escherichia coli	Sn-glycerol-3-phosphate	323	100

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SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				transport system permease protein UgpA.		
46	10282	Y29817	Homo sapiens	Human synapse related glycoprotein 2.	521	96
47	1031	gi64351 30	Mus musculus	putative E1-E2 ATPase	990	86
48	1040	gi85412 4	Homo sapiens	Human giant larvae homologue	471	63
49	1043	gi38822 85	Homo sapiens	KIAA0782 protein	154	61
50	1051	gi17821 6	Homo sapiens	anion exchange protein 1	172	100
51	1053	Y76748	Homo sapiens	Human protein kinase homologue, PKH-1.	180	92
52	1062	gi96501 4	Mus musculus	ADAM 4 protein precursor	492	65
53	1063	gi23938 80	Drosophila melanogaster	A-kinase anchor protein DAKAP550	580	60
54	1066	gi27467 88	Caenorhabditi s elegans	contains similarity to transacylases	607	35
55	107	G00357	Homo sapiens	Human secreted protein,	183	77
56	1071	gi91059 37	Xylella fastidiosa	Acetylgluta-mate kinase	505	36
57	1085	R95913	Homo sapiens	Neural thread protein.	257	55
58	1086	Y76332	Homo sapiens	Fragment of human secreted protein encoded by gene 38.	387	58
59	1088	gi45896 42	Homo sapiens	KIAA0999 protein	873	99
60	109	gi76343 1	Homo sapiens	KIAA0999 protein	360	85
61	1095	Y94907	Homo sapiens	Human secreted	701	97

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
				protein clone ca106_19x protein sequence		
62	1102	Y07096	Homo sapiens	Colon cancer associated antigen precursor sequence.	1982	100
63	1105	Y84907	Homo sapiens	A human proliferation and apoptosis related protein.	983	91
64	1108	gi13989 03	Mus musculus	Ca2+ dependent activator protein for secretion	1307	89
65	1109	Y91524	Homo sapiens	Human secreted protein sequence encoded by gene 74	2400	99
66	1113	gi16574 62	Sus scrofa	calcium/cal- modulin- dependent protein kinase II isoform gamma-E	1348	94
67	1117	Y32169	Homo sapiens	Human growth- associated protease inhibitor heavy chain precursor.	2831	97
68	1118	gi30635 17	Homo sapiens		1138	98
69	1125	gi82482 .85	Homo sapiens	sphingosine kinase type 2 isoform	1290	98
70	1132	Y94918	Homo sapiens	Human secreted protein clone dd504_18 protein sequence	437	59
71	1143	gi45806	Homo sapiens	prepro-major	209	40

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
		77		basic protein homolog		
72	1146	gi182395	Homo sapiens	focal adhesion kinase	131	87
73	1161	W90962	Homo sapiens	Human CSGP-2 protein.	931	100
74	117	W69428	Homo sapiens	Human secreted protein bp537_4.	159	93
75	1170	gi34339	Homo sapiens		586	87
76	1175	gi7960243	Homo sapiens	SNARE protein kinase SNAK	308	100
77	118	gi5360093	Homo sapiens	NY-REN-18 antigen	178	96
78	1183	gi292037	Homo sapiens	helix-loop-helix phosphoprotein	361	91
79	1193	gi1899186	Rattus norvegicus	polysialyltransferase	171	76
80	1195	gi1399462	Homo sapiens	serine/threonine-protein kinase PRP4h	208	71
81	1198	gi181535	Homo sapiens	defensin precursor	150	71
82	1201	gi5668935	Rattus norvegicus	plasma membrane Ca2+ ATPase isoform 1kb	244	73
83	1207	gi6224868	Homo sapiens	TANK binding kinase TBK1	716	86
84	1210	gi179646	Homo sapiens	complement component C1s	242	61
85	1211	gi1483187	Homo sapiens		296	65
86	1214	gi7800638	Streptococcus pneumoniae	PspA	121	37
87	123	Y44810	Homo sapiens	Human Aspartic Protease-2 (NHAP-2).	218	93
88	1259	gi2116672	Homo sapiens	EAR-1r	128	70
89	1266	gi7243125	Homo sapiens	KIAA1372 protein	403	53
90	1270	gi1289445	Homo sapiens	diacylglycerol kinase epsilon DGK	125	96

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
91	1290	gi1429371	Drosophila melanogaster	ubiquitin-specific protease	470	41
92	1291	Y66755	Homo sapiens	Membrane-bound protein PRO1185.	993	100
93	1296	gi9652087	Homo sapiens	scavenger receptor cysteine-rich type 1 protein M160 precursor	1183	99
94	1299	gi7300398	Drosophila melanogaster	CG7683 gene product	397	40
95	1317	gi3695115	Rattus norvegicus	CL1AA	216	100
96	132	gi187171	Homo sapiens	12-lipoxygenase	176	97
97	1330	Y12482	Homo sapiens	Human 5' EST secreted protein	65	44
98	1336	gi10798814	Homo sapiens	MLTK-beta	2366	99
99	135	gi4560690	Homo sapiens	effector cell protease receptor 1	190	74
100	1356	gi193057	Mus musculus	envelope polyprotein precursor	131	36
101	1369	gi4586657	Homo sapiens	glucocorticoid receptor alpha-2	596	89
102	1392	gi8493519	Mus musculus	nuclear localization signal binding protein	145	59
103	1408	gi3127051	Rattus norvegicus	potassium channel regulatory protein KChAP	176	84
104	141	gi6453613	Mus musculus	putative protein kinase	204	33
105	1424	gi2982501	Homo sapiens	neuropathy target esterase	769	100
106	143	W50033	Homo sapiens	Human immunity related factor.	1201	98
107	1431	gi10644	Heterodera	hypothetical	133	36

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Waterman Score	% Identity
		565	glycines	esophageal gland cell secretory protein 10		
108	1441	gi3044086	Myxococcus xanthus	unknown	149	32
109	1444	gi7248381	Homo sapiens	adaptor protein p130Cas	1615	97
110	1447	Y65168	Homo sapiens	Human 5' EST related polypeptide	403	97
111	1457	W19919	Homo sapiens	Human Ksr-1 (kinase suppressor of Ras).	227	77
112	1471	G02532	Homo sapiens	Human secreted protein,	97	59
113	1473	gi6062874	Homo sapiens	candidate tumor suppressor protein DICE1	581	100
114	1474	Y64896	Homo sapiens	Human 5' EST related polypeptide	197	100
115	1483	gi4362188	Homo sapiens	KIAA0037	295	76
116	1486	gi5852834	Homo sapiens	bridging integrator-2	133	64
117	149	gi3327162	Homo sapiens	KIAA0674 protein	2243	98
118	1503	gi1736785	Escherichia coli	.	1270	97
119	1506	gi4062298	Escherichia coli	YhhI protein	612	90
120	1513	gi4062346	Escherichia coli	.	556	94
121	1514	gi216609	Escherichia coli	PhoQ protein	661	90
122	1523	gi5712756	Rattus norvegicus	calcium transporter CaT1	1178	90
123	1527	gi1853980	Mus musculus	glucocorticoid receptor interacting protein 1	171	84
124	1536	Y17227	Homo sapiens	Human secreted	452	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				protein (clone ya1-1).		
125	154	gi8515090	Pinus taeda	putative arabinogalactan protein	81	40
126	1544	gi3879933	Caenorhabditis elegans	Similarity to Xenopus F-spondin precursor (PIR Acc. No. comes from this gene	134	34
127	1554	gi6523817	Homo sapiens	S1R protein	255	84
128	1555	gi6635205	Homo sapiens	beta-ureidopropionase	210	90
129	1556	Y39286	Homo sapiens	Phosphodiesterase 10 (PDE10) clone FB93a.	161	61
130	1564	gi8977945	Streptomyces coelicolor A3(2)	putative secreted serine protease	231	45
131	1576	gi3025828	Rattus norvegicus	signal transducer and activator of transcription 4	183	97
132	1578	gi5106572	Homo sapiens	transcriptional activator SRCAP	758	98
133	1579	gi8575527	Homo sapiens	toll-like receptor 8	595	99
134	158	gi4060558	Mus musculus	protein kinase	168	70
135	1580	gi63340	Gallus gallus	c-Rmil	231	90
136	1588	gi2217931	Homo sapiens	PKU-alpha	127	92
137	1589	gi1272422	Mus musculus	Phosphoinositide 3-kinase	720	99
138	159	gi2224629	Homo sapiens	KIAA0344	215	43
139	1600	gi1016012	Rattus norvegicus	neural cell adhesion protein BIG-2 precursor	543	93
140	161	gi6649583	Homo sapiens	kidney and liver proline	1651	98

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				oxidase 1		
141	1612	gi406113	Rattus norvegicus	protein kinase I	125	89
142	1615	gi219992	Homo sapiens	phSR2	150	78
143	1620	gi5714636	Homo sapiens	serine/threonine protein kinase Kp78 splice variant CTAK75a	126	71
144	1644	Y13352	Homo sapiens	Amino acid sequence of protein PRO228.	2542	100
145	1647	Y99444	Homo sapiens	Human PRO1575 (UNQ781) amino acid sequence	704	100
146	1650	gi3789765	Homo sapiens	transmembrane receptor UNC5C	271	100
147	1663	W75258	Homo sapiens	Fragment of human secreted protein encoded by gene 26.	163	96
148	1665	gi10432431	Homo sapiens	secreted modular calcium-binding protein	1428	99
149	1671	gi6708169	Mus musculus	inositol phosphatase eSHIPD183	169	97
150	1672	Y68773	Homo sapiens	Amino acid sequence of a human phosphorylation effector PHSP-5.	1030	99
151	1678	gi6063017	Homo sapiens	tousled-like kinase 1	132	86
152	1680	gi3510603	Homo sapiens	nuclear receptor co-repressor N-CoR	278	80
153	1692	gi1546084	Homo sapiens	farnesol receptor HRR-1	165	100
154	1698	gi520469	Oryctolagus cuniculus	597 aa protein related to	177	94

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
				Na/glucose cotransporters		
155	1702	gi10432 382	Homo sapiens		519	95
156	1704	Y91668	Homo sapiens	Human secreted protein sequence encoded by gene 73	214	75
157	1708	gi30807 57	Mus musculus	growth factor independence- 1B	457	78
158	1716	gi29653	Homo sapiens	putative oncogene	220	92
159	173	gi34524 73	Rattus norvegicus	serine/threo- nine protein kinase TAO1	699	100
160	1731	Y27581	Homo sapiens	Human secreted protein encoded by gene No. 15.	774	100
161	1732	gi96520 87	Homo sapiens	scavenger receptor cysteine-rich type 1 protein M160 precursor	1025	98
162	174	Y35923	Homo sapiens	Extended human secreted protein sequence,	1691	100
163	1740	Y53014	Homo sapiens	Human secreted protein clone fn189_13 protein sequence	337	60
164	1748	gi77702 37	Homo sapiens	PRO2822	218	93
165	1751	gi89798 25	Homo sapiens		306	50
166	1755	R95332	Homo sapiens	Tumor necrosis factor receptor 1 death domain ligand (clone	1184	62

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				3TW).		
167	1762	gi7380947	Homo sapiens	Gem-interacting protein	1545	99
168	1776	gi5912265	Homo sapiens	hypothetical protein	224	100
169	1777	Y70461	Homo sapiens	Human membrane channel protein-11 (MECHP-11).	413	95
170	1781	R26060	Homo sapiens	Growth Factor Receptor Bound protein GRB-1.	398	98
171	1796	gi10312169	Homo sapiens	serine carboxypepti-dase 1 precursor protein	1381	99
172	180	gi3002527	Homo sapiens	neuronal thread protein AD7c-NTP	477	61
173	182	gi7385131	Homo sapiens	HBV pX associated protein-8; XAP-8	2066	82
174	1820	G03249	Homo sapiens	Human secreted protein,	370	97
175	1822	gi4739969	Oryctolagus cuniculus	one of the members of sodium-glucose cotransporter family	1048	90
176	1829	gi10440355	Homo sapiens	FLJ00012 protein	310	96
177	1832	gi1656550	Oryctolagus cuniculus	phosphorylase kinase beta-subunit	146	96
178	1834	W75132	Homo sapiens	Human secreted protein encoded by gene 11 clone HCENJ40.	423	47
179	1837	gi60369	Saimiriine herpesvirus 2	ORF 48-EDLF5-sim. to EBV BRRF2	615	71

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
180	1859	gi9989696	Homo sapiens	ROR2 protein	645	87
181	1880	gi7340847	Mus musculus	chondroItin 4-sulfotransferase	275	40
182	1881	gi7573291	Homo sapiens		298	100
183	1890	gi3149950	Homo sapiens	ST1C2	183	94
184	1899	gi2143260	Homo sapiens	Phosphoino-sitide 3-kinase	346	98
185	19	gi1808582	Homo sapiens	U2AF1-RS2	224	46
186	192	G03192	Homo sapiens	Human secreted protein,	267	86
187	1922	gi485858	Mus musculus	IB3/5-polypeptide	1206	78
188	1945	gi37261	Homo sapiens		1402	97
189	195	W67863	Homo sapiens	Human secreted protein encoded by gene 57 clone HFEBF41.	551	98
190	1957	gi1406738	Homo sapiens	Shb	263	44
191	1969	Y41701	Homo sapiens	Human PRO708 protein sequence.	975	98
192	1970	gi3979817	Caenorhabditis elegans	Weak similarity to Human tyrosine-protein kinase CSK	254	49
193	1973	G00796	Homo sapiens	Human secreted protein,	365	98
194	1985	gi4558637	Homo sapiens	Putative homolog of hypoxia inducible factor three alpha	1420	99
195	1986	gi4455015	Homo sapiens	host cell factor homolog	367	50

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				LCP		
196	2	G02532	Homo sapiens	Human secreted protein,	106	85
197	2004	gi10503935	Homo sapiens	type A calpain-like protease	961	100
198	2023	gi1651341	Escherichia coli	.	1075	97
199	2025	Y71069	Homo sapiens	Human membrane transport protein, MTRP-14.	540	100
200	2038	gi8572543	Homo sapiens	membrane-associated lectin type-C	686	98
201	2041	gi37400	Homo sapiens	trk-2h polypeptide	228	89
202	2043	W75096	Homo sapiens	Human secreted protein encoded by gene 40 clone HNEDJ57.	290	38
203	2068	G03394	Homo sapiens	Human secreted protein,	595	97
204	2072	gi2116552	Rattus norvegicus	cationic amino acid transporter 3	1025	85
205	2076	gi157409	Drosophila melanogaster	fat protein	369	39
206	2078	gi1054940	Gallus gallus	cSH-PTP2	605	94
207	2084	gi9663128	Homo sapiens	hypothetical protein	874	99
208	2088	gi10567590	Homo sapiens	sodium bicarbonate cotransporter-like protein	609	100
209	2089	gi1789001	Escherichia coli	putative ATP-binding component of a transport system	961	98
210	2097	Y70460	Homo sapiens	Human membrane channel	258	96

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Waterman Score	% Identity
				protein-10 (MECHP-10).		
211	2108	gi3207508	Rattus norvegicus	hexokinase	767	74
212	2111	gi6330233	Homo sapiens	KIAA1176 protein	3710	99
213	2118	W74797	Homo sapiens	Human secreted protein encoded by gene 68 clone HKIXR69.	156	96
214	2134	gi1780991	Homo sapiens	branched chain acyl-CoA oxidase	209	97
215	2146	gi7688148	Homo sapiens	hypothetical protein	1038	100
216	2149	gi2280485	Homo sapiens	KIAA0376	917	100
217	2153	gi1842429	Rattus norvegicus	ankyrin binding cell adhesion molecule neurofascin	592	88
218	2155	gi6526791	Homo sapiens	Eps15R	1126	100
219	2161	gi7300427	Drosophila melanogaster	CG7709 gene product	200	33
220	2163	Y52296	Homo sapiens	Human isomerase homologue-3 (HIH-3).	186	91
221	2173	W34526	Homo sapiens	hTCP protein fragment.	164	93
222	2178	gi3360512	Rattus norvegicus	Citron-K kinase	299	94
223	2180	Y74008	Homo sapiens	Human prostate tumor EST fragment derived protein #195.	261	41
224	2184	gi53041	Mus musculus		130	41
225	2186	gi401774	Homo sapiens	ribosomal protein S6 kinase 3	142	64
226	2190	gi5772955	Homo sapiens	The ha1225 gene product is related to human alpha-	176	100

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith - Water man Score	% Identity
				glucosidase.		
227	2210	gi20553 92	Rattus norvegicus	transmembrane receptor UNC5H1	620	90
228	2214	gi78617 33	Homo sapiens	low density lipoprotein receptor related protein-deleted in tumor	1360	98
229	2223	gi79591 89	Homo sapiens	KIAA1464 protein	884	99
230	223	W88627	Homo sapiens	Secreted protein encoded by gene 94 clone HPMBQ32.	300	77
231	2233	gi78395 87	Homo sapiens	organic anion transporting polypeptide 14	1092	99
232	2237	gi10440 400	Homo sapiens	FLJ00033 protein	1212	99
233	2251	gi59237 86	Homo sapiens	zinc metallo-protease ADAMTS6	277	44
234	2256	W63698	Homo sapiens	Human secreted protein 18.	516	100
235	2259	gi46787 22	Homo sapiens	hypothetical protein	387	36
236	2262	Y33741	Homo sapiens	Beta-secretase.	793	99
237	2265	gi70185 45	Homo sapiens	hypothetical protein	608	94
238	2271	gi41861 83	Homo sapiens	unknown	684	53
239	2273	gi72430 35	Homo sapiens	KIAA1327 protein	1031	100
240	2280	gi58096 78	Homo sapiens	sperm membrane protein BS-63	342	95
241	2286	gi62246 91	Homo sapiens	Na+/sulfate cotransporter SUT-1	1221	99
242	2291	gi20762 1	Rattus norvegicus	uromodulin	345	50
243	2292	gi72963 04	Drosophila melanogaster	CG5274 gene product	272	35
244	2294	Y28503	Homo sapiens	HGFH3 Human Growth Factor	320	98

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				Homologue 3.		
245	2296	W88799	Homo sapiens	Polypeptide fragment encoded by gene 45.	223	86
246	2303	gi7110160	Homo sapiens	guanine nucleotide exchange factor	1212	99
247	2306	gi6434874	Mus musculus	calcium/calmodulin dependent protein kinase kinase alpha	576	84
248	2309	Y95433	Homo sapiens	Human calcium channel SOC-2/CRAC-1 C-terminal polypeptide.	1203	99
249	2313	gi7300943	Drosophila melanogaster	CG4677 gene product	689	79
250	2318	W48351	Homo sapiens	Human breast cancer related protein BCRB2.	202	59
251	2329	G01772	Homo sapiens	Human secreted protein,	311	84
252	2330	Y41729	Homo sapiens	Human PRO1071 protein sequence.	886	99
253	2342	gi3786430	Caenorhabditis elegans		268	42
254	2350	gi930104	Homo sapiens	protein-tyrosine phosphatase	571	79
255	2359	gi9392591	Homo sapiens	CC chemokine CCL28	679	99
256	2361	gi1666689	Mus musculus	alpha-NAC, muscle-specific form gp220	357	41
257	2374	G03172	Homo sapiens	Human secreted protein,	112	78
258	2387	gi1399197	Homo sapiens	pyruvate dehydrogenase kinase isoform 4	201	85
259	2401	G01757	Homo sapiens	Human	612	99

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				secreted protein,		
260	2409	gi181123	Homo sapiens	cleavage signal 1 protein	194	86
261	2431	gi7018547	Homo sapiens	hypothetical protein	473	50
262	2432	gi4826496	Homo sapiens		327	39
263	2467	G03667	Homo sapiens	Human secreted protein,	640	97
264	2471	gi7688148	Homo sapiens	hypothetical protein	1284	91
265	2478	gi790819	Homo sapiens	polycystic kidney disease-associated protein	615	90
266	2484	gi3327080	Homo sapiens	KIAA0633 protein	1747	99
267	249	G03793	Homo sapiens	Human secreted protein,	139	65
268	2490	gi6467371	Homo sapiens	thyrotropin-releasing hormone degrading ectoenzyme	757	98
269	25	G03203	Homo sapiens	Human secreted protein,	137	65
270	2504	gi4097712	Homo sapiens	HBV associated factor	166	74
271	2506	gi2072784	Homo sapiens	Na+/nucleoside cotransporter	201	95
272	2507	gi5924007	Homo sapiens		335	38
273	2510	gi7717385	Homo sapiens	beta-site APP-cleaving enzyme 2, EC 3.4.23.	383	89
274	2523	gi339709	Homo sapiens		150	96
275	253	gi36615	Homo sapiens	serine/threonine protein kinase	391	77
276	2533	gi45896	Homo sapiens	KIAA0985	191	61

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
	14			protein		
277	2536	gi2088685	Caenorhabditis elegans	strong similarity to the CDC2/CDX subfamily of ser/thr protein kinases	419	55
278	2544	gi1002425	Mus musculus	YSPL-1 form 2	280	80
279	2568	Y41738	Homo sapiens	Human PRO541 protein sequence.	379	49
280	2580	gi3004482	Rattus norvegicus	putative integral membrane transport protein	382	49
281	2593	gi7300049	Drosophila melanogaster	CG4525 gene product	582	50
282	2600	gi4530437	Homo sapiens	thyroid hormone receptor-associated protein complex component TRAP240	334	90
283	2625	gi8099652	Homo sapiens	toll-like receptor 9 form A	761	96
284	2641	gi148019	Escherichia coli	tolA	692	100
285	2667	gi1750387	Pseudomonas aeruginosa	Carbamoyl-phosphate synthetase large subunit	143	76
286	2670	gi4883437	Mus musculus	RNA binding protein	139	92
287	2673	Y66656	Homo sapiens	Membrane-bound protein PRO943.	1869	98
288	2676	gi3885978	Mus musculus	mismatch-specific thymine-DNA glycosylate	123	88
289	2680	gi6453438	Homo sapiens	hypothetical protein	465	82
290	2682	gi18417	Mus musculus	GATA-5	527	77

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
		56		cardiac transcription factor		
291	2684	gi9844920	Homo sapiens	nicotinic acetylcholine receptor subunit alpha 10	294	88
292	2695	gi1789764	Escherichia coli	putative transport	879	98
293	2697	gi349229	Escherichia coli	peripheral membrane protein	936	99
294	2698	gi4062194	Escherichia coli	.	737	100
295	2700	gi529240	Escherichia coli	homoserine kinase	578	100
296	2704	gi1552831	Escherichia coli	hypothetical	420	100
297	2712	gi1789672	Escherichia coli	putative ATP-binding component of a transport system	262	100
298	2716	gi4062409	Escherichia coli	Transmembrane protein dppC	382	100
299	2719	gi304976	Escherichia coli	matches PS00017: ATP_GTP_A and PS00301: EFACTOR_GTP; similar	921	95
300	2724	gi145856	Escherichia coli	nmpC	647	97
301	2725	gi1789473	Escherichia coli	putative transport protein	312	100
302	2728	gi1805561	Escherichia coli		222	97
303	2729	gi43248	Escherichia coli		655	91
304	2744	gi396299	Escherichia coli	similar to E. coli pyruvate formate-lyase activating enzyme	675	100
305	2749	gi1742648	Escherichia coli	.	592	100
306	2752	gi40622	Escherichia	Sensor kinase	357	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith - Waterman Score	% Identity
		36	coli	CitA		
307	2762	gi1787795	Escherichia coli	putative LACI-type transcriptional regulator	342	100
308	2764	gi1799743	Escherichia coli	putative LACI-type transcriptional regulator	151	84
309	2768	gi405964	Escherichia coli	yohG	534	94
310	2774	gi4062338	Escherichia coli	.	387	97
311	2790	gi4062338	Escherichia coli	.	420	86
312	2800	gi1789805	Escherichia coli	putative transport	572	100
313	2811	gi5305333	Mus musculus	protein kinase Myak-S	421	49
314	2827	gi10047251	Homo sapiens	KIAA1588 protein	531	97
315	2830	G02872	Homo sapiens	Human secreted protein,	185	62
316	2836	gi191175	Cricetulus sp.	cAMP-dependent protein kinase alpha-catalytic subunit	1677	97
317	2851	gi558846	Homo sapiens	BCL2/adeno-virus E1B 19kD-interacting protein 3	220	61
318	2856	gi3882211	Homo sapiens	KIAA0745 protein	232	93
319	2866	gi6329708	Homo sapiens	KIAA1119 protein	1331	91
320	2874	gi2853033	Mus musculus	tousled-like kinase	203	82
321	2882	gi10185134	Schizosaccharomyces pombe	hypothetical zinc-finger protein	318	42
322	2886	G03797	Homo sapiens	Human secreted protein,	140	69
323	2899	gi4240325	Homo sapiens	KIAA0918 protein	170	53

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
324	2906	Y94988	Homo sapiens	Human secreted protein v11_1,	1738	100
325	2920	gi9453735	Homo sapiens		1926	100
326	2925	gi6434876	Homo sapiens	CDK4-binding protein p34SEI1	1210	100
327	2930	gi3941320	Schistosoma japonicum	myosin	208	28
328	2934	Y31645	Homo sapiens	Human transport-associated protein-7 (TRANP-7).	642	63
329	2955	G01165	Homo sapiens	Human secreted protein,	528	99
330	2967	gi7263960	Homo sapiens		466	100
331	2980	gi4589530	Homo sapiens	KIAA0943 protein	1849	94
332	2994	G03812	Homo sapiens	Human secreted protein,	124	61
333	2996	gi9857400	Homo sapiens	tumor endothelial marker 1 precursor	2666	98
334	2999	Y66697	Homo sapiens	Membrane-bound protein PRO1383.	2254	100
335	3	gi6289072	Homo sapiens	JM24 protein	930	100
336	3008	Y45219	Homo sapiens	Human CASB47 protein.	557	92
337	3013	gi5262678	Homo sapiens	hypothetical protein	1747	100
338	3041	Y73335	Homo sapiens	HTRM clone 1850120 protein sequence.	1315	99
339	306	gi4868443	Mesocricetus auratus	Mx-interacting protein kinase PKM	1867	95
340	3061	gi433338	Homo sapiens	protein-tyrosine kinase	3934	94

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
341	309	Y76145	Homo sapiens	Human secreted protein encoded by gene 22.	1313	99
342	3095	gi73001 59	Drosophila melanogaster	CG14899 gene product	190	57
343	3098	gi53205 6	Homo sapiens	protein-tyrosine-phosphatase	2641	86
344	3105	gi28598 7	Homo sapiens	mitochondrial outer membrane protein 19	192	71
345	3118	gi99299 35	Macaca fascicularis	hypothetical protein	180	61
346	3124	gi81319 03	Mus musculus	transient receptor potential-related protein	226	100
347	3126	Y02370	Homo sapiens	Polypeptide identified by the signal sequence trap method.	261	100
348	3166	gi72908 60	Drosophila melanogaster	CG1531 gene product	534	42
349	3175	gi66495 83	Homo sapiens	kidney and liver proline oxidase 1	1752	95
350	3176	gi72084 38	Homo sapiens	long-chain 2-hydroxy acid oxidase HAOX2	1048	95
351	3188	Y02693	Homo sapiens	Human secreted protein encoded by gene 44 clone HTDAD22.	243	57
352	3191	gi71059 26	Homo sapiens	calcium channel alpha2-delta3 subunit	300	96
353	3208	gi10334 774	Homo sapiens	·MUCDHL-FL	613	98
354	3226	Y87209	Homo sapiens	Human secreted protein sequence	3147	99

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
355	3235	gi6715135	Homo sapiens	Fanconi anemia, complementation group F	1947	99
356	3257	gi5441615	Canis familiaris	zinc finger protein	326	42
357	3282	G03002	Homo sapiens	Human secreted protein,	211	61
358	3289	gi3288457	Homo sapiens	PI3-kinase	5832	97
359	3296	gi7770139	Homo sapiens	PRO1722	293	64
360	3298	gi2198815	Ambystoma tigrinum	electrogenic Na+ bicarbonate cotransporter; NBC	1278	52
361	3303	gi4028015	Homo sapiens	potassium channel	1881	92
362	3305	gi5902966	Homo sapiens	very large G-protein coupled receptor-1	1770	100
363	3308	gi219944	Homo sapiens	The first in-frame ATG codon is located at nucleotides NPPase.	3967	86
364	3325	gi3510234	Homo sapiens	R31237_1, partial CDS	192	94
365	3341	W78899	Homo sapiens	Human UNC-5 homologue UNC5H-1.	1614	90
366	3342	gi1478205	Mus musculus	PNG protein	341	70
367	3350	gi2739460	Bos taurus	regulator of G-protein signaling 7	2263	98
368	3372	gi7671663	Homo sapiens		375	79
369	338	Y84322	Homo sapiens	A human cardiovascular system associated protein kinase-3.	2606	100
370	3383	gi10441	Homo sapiens	protein	1127	100

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith - Water man Score	% Identity
		382		kinase		
371	3395	gi53082 3	Homo sapiens	epidermal growth factor receptor kinase substrate	402	47
372	3405	Y29332	Homo sapiens	Human secreted protein clone pe584_2 protein sequence.	1220	94
373	3408	gi33347 41	Homo sapiens	shal-type potassium channel	2888	90
374	345	gi45395 27	Homo sapiens	NAALADase L protein	600	72
375	346	Y95434	Homo sapiens	Human calcium channel SOC-3/CRAC-2 C-terminal polypeptide.	1802	99
376	3470	gi97984 52	Homo sapiens	putative capacitative calcium channel	277	100
377	3482	gi38185 72	Homo sapiens	cAMP-specific phosphodiester ase 8B; PDE8B1; 3',5'-cyclic nucleotide phosphodiester ase	2353	96
378	3492	gi16658 25	Homo sapiens		3878	99
379	3530	gi50510 0	Homo sapiens	KIAA0066	3637	100
380	3533	Y32169	Homo sapiens	Human growth-associated protease inhibitor heavy chain precursor.	2860	99
381	3545	gi66241 33	Homo sapiens		449	98
382	3549	gi14691 93	Homo sapiens	The KIAA0135 gene is related to	5374	99

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
				pim-1 oncogene.		
383	3595	gi163301 90	Homo sapiens	KIAA1169 protein	1893	100
384	3601	gi80891 5	Homo sapiens	tumor necrosis factor receptor type 1 associated protein	992	99
385	3612	gi53054 48	Mus musculus	SH2-B PH domain containing signaling mediator 1 gamma isoform	1439	92
386	3613	Y32194	Homo sapiens	Human receptor molecule (REC) encoded by Incyte clone 266775.	1438	100
387	3621	gi89784 9	Mus musculus	ubiquitinating enzyme E2-230 kDa	393	68
388	3624	R47858	Homo sapiens	Human LDL receptor Domains 1 and 2.	2895	100
389	3625	Y57949	Homo sapiens	Human transmembrane protein HTMPN-73.	1868	100
390	3626	W69342	Homo sapiens	Secreted protein of clone CJ424_9.	442	94
391	3627	gi65371 36	Homo sapiens	putative organic anion transporter	982	92
392	3630	Y06886	Homo sapiens	HWHHJ20 polypeptide.	1109	91
393	3642	gi48864 67	Homo sapiens	hypothetical protein	570	52
394	3645	gi95884 02	Homo sapiens		598	98
395	3647	Y12050	Homo sapiens	Human 5' EST secreted protein	517	98

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Waterman Score	% Identity
396	3653	Y70018	Homo sapiens	Human Protease and associated protein-12 (PPRG-12).	2232	99
397	3676	W67818	Homo sapiens	Human secreted protein encoded by gene 12 clone HMSJJ74.	338	100
398	3677	gi32093	Homo sapiens	HGMP07J	650	52
399	3681	Y48443	Homo sapiens	Human prostate cancer-associated protein 140.	803	93
400	3682	gi4691726	Homo sapiens	ARF GTPase-activating protein GIT1	2435	91
401	3688	gi6693824	Homo sapiens	ubiquitin-specific protease	1995	99
402	3689	Y94927	Homo sapiens	Human secreted protein clone ck213_12 protein sequence	530	81
403	3690	gi1871612	Oryctolagus cuniculus	ryanodine receptor	594	95
404	3706	gi6002714	Homo sapiens	membrane-type serine protease 1	2630	94
405	3714	gi2695708	Homo sapiens	SPOP	553	81
406	3720	gi9309293	Homo sapiens	asc-type amino acid transporter 1	566	95
407	3726	gi10440381	Homo sapiens	FLJ00026 protein	1023	69
408	373	gi5714696	Mus musculus	alpha 2 delta calcium channel subunit	243	95
409	3788	gi6911219	Homo sapiens	type II membrane serine protease	841	100

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
410	3789	Y45023	Homo sapiens	Human sensory transduction G-protein coupled receptor-B3.	1084	95
411	3790	gi15240 88	Homo sapiens	Polio virus receptor protein	1508	99
412	3801	gi67236 75	Homo sapiens	mitotic kinase-like protein-1	2035	99.
413	3803	gi96897 3	Homo sapiens	mitotic kinase-like protein-1	332	86
414	3820	gi17704 78	Homo sapiens	NK receptor	1988	99
415	3831	gi27813 86	Homo sapiens	.	1493	99
416	3837	gi93678 40	Homo sapiens	neuronal apoptosis inhibitory protein 2	2243	99
417	385	gi15269 78	Homo sapiens	ryanodine receptor 2	149	96
418	3856	gi99565 4	Homo sapiens	interleukin-11 receptor	147	100
419	386	gi49600 38	Mus musculus	T2K protein kinase homolog	669	66
420	3861	Y74129	Homo sapiens	Human prostate tumor EST fragment derived protein #316.	842	98
421	3883	gi66352 05	Homo sapiens	beta-ureidopropiona se	1576	100
422	3898	gi37231	Homo sapiens	DNA topoisomerase II	8436	99
423	3921	gi86488 81	Homo sapiens	putative organic anion transporter	131	100
424	3932	gi85757 75	Homo sapiens	KRAB zinc finger protein	1935	99
425	3934	gi46891 28	Homo sapiens	SIH003	127	92
426	3963	gi32129 96	Homo sapiens		339	64
427	3974	G03790	Homo sapiens	Human	232	63

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				secreted protein,		
428	3983	gi181971	Homo sapiens	vascular endothelial growth factor	433	85
429	3999	gi1657464	Sus scrofa	calcium/calmodulin-dependent protein kinase II isoform gamma-G	484	75
430	4001	gi6572230	Homo sapiens		329	100
431	4009	gi2143260	Homo sapiens	phosphoinositide 3-kinase	521	99
432	401	gi6572379	Homo sapiens		1372	56
433	4020	gi2815624	Homo sapiens	tumor necrosis factor superfamily member LIGHT	1252	100
434	4024	Y21166	Homo sapiens	Human bcl2 proto-oncogene mutant protein fragment 14.	84	40
435	4040	Y57285	Homo sapiens	Human GPCR protein (HGPRP) sequence (clone ID 2214673).	1726	99
436	4057	W74873	Homo sapiens	Human secreted protein encoded by gene 145 clone HFXHL79.	531	100
437	4066	G03714	Homo sapiens	Human secreted protein,	92	70
438	4067	gi8331760	Homo sapiens	LU1 protein	1077	92
439	4078	Y57900	Homo sapiens	Human transmembrane protein HTMPN-24.	996	100
440	4120	gi18715	Homo sapiens	mitogen-	927	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
		39		activated protein kinase phosphatase 4		
441	4123	gi5360125	Homo sapiens	NY-REN-58 antigen	140	100
442	4130	gi6289072	Homo sapiens	JM24 protein	604	100
443	4133	gi8575527	Homo sapiens	toll-like receptor 8	755	100
444	4166	gi6118555	Homo sapiens	DEAD-box protein abstrakt	2512	100
445	4167	gi3800830	Rattus norvegicus	putative four repeat ion channel	615	93
446	4172	gi7209676	Homo sapiens	potassium channel Kv8.1	369	100
447	4185	gi5305405	Homo sapiens	Na+/H+ exchanger isoform 2	1769	100
448	4197	gi2811122	Xenopus laevis	NaDC-2	524	69
449	4203	Q89840_aa1	Homo sapiens	Human death associated protein DAP-3.	198	97
450	4262	gi5901478	Marmota marmota	olfactory receptor	209	92
451	4276	gi32456	Homo sapiens	protein-tyrosine phosphatase	3270	99
452	4283	R41231	Homo sapiens	GAT-2 transporter gene.	477	100
453	4331	gi3171912	Homo sapiens	RAMP2	443	98
454	4340	gi8118223	Homo sapiens	unknown	1330	100
455	4351	gi1754515	Rattus norvegicus	aminopeptidase-B	2050	92
456	4354	Y57906	Homo sapiens	Human transmembrane protein HTMPN-30.	1402	100
457	4385	gi5596433	Homo sapiens	candidate tumor suppressor protein NOC2	509	97

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
458	4388	W78140	Homo sapiens	Human secreted protein encoded by gene 15 clone HSDES04.	100	94
459	4405	Y48226	Homo sapiens	Human prostate cancer-associated protein 12.	1246	99
460	441	gi291536	Bovine herpesvirus 1	BICP4	106	35
461	4417	gi656533	Homo sapiens	sialin	939	100
462	4419	gi184155	Homo sapiens	NG5	146	33
463	4443	gi496139	Mus musculus	AMPA selective glutamate receptor	262	94
464	4470	gi7248381	Homo sapiens	adaptor protein p130Cas	2592	100
465	4482	gi7329979	Homo sapiens	apoptosis regulator	2071	100
466	4487	gi6706659	Homo sapiens		405	100
467	4491	gi9837341	Homo sapiens	CamKI-like protein kinase	1044	100
468	4492	Y42751	Homo sapiens	Human calcium binding protein 2 (CaBP-2).	586	99
469	4497	gi6179740	Homo sapiens	paraneoplastic cancer-testis-brain antigen	352	37
470	4502	gi6329742	Homo sapiens	KIAA1124 protein	327	100
471	4519	Y99426	Homo sapiens	Human PRO1604 (UNQ785) amino acid sequence	1563	100
472	4526	Y08008	Homo sapiens	Human HLIG-1 protein.	4023	99
473	4547	gi4589562	Homo sapiens	KIAA0959 protein	4165	99
474	4554	gi1381029	Mus musculus		1164	77

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SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
475	4555	gi27923 66	Homo sapiens	unknown protein IT12	4461	99
476	457	Y70551	Homo sapiens	Human latent transforming growth factor-beta binding protein 3 (I).	1825	100
477	4571	gi53601 15	Homo sapiens	NY-REN-45 antigen	869	100
478	4613	Y05868	Homo sapiens	Human Toll protein PRO358.	2413	100
479	4614	Y27129	Homo sapiens	Human bone marrow-derived polypeptide (clone OAF038-Leu).	1815	100
480	4622	G03789	Homo sapiens	Human secreted protein,	173	53
481	4667	gi76736 38	Danio rerio	Dedd1	446	48
482	4670	gi40264 9	Homo sapiens	c-rel	2309	100
483	4683	Y68773	Homo sapiens	Amino acid sequence of a human phosphorylatio n effector PHSP-5.	2234	99
484	4698	Y73470	Homo sapiens	Human secreted protein clone yd141_1 protein sequence	746	100
485	4724	gi64568 46	Homo sapiens	hypothetical protein	1101	99
486	4734	gi33349 82	Homo sapiens	R27216_1	1151	80
487	4814	gi62744 73	Homo sapiens	pregnancy-induced growth inhibitor	1348	100
488	4819	Y07825	Homo sapiens	Human secreted protein fragment #4 encoded from	117	67

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				gene 28.		
489	4821	Y81498	Homo sapiens	Human foetal bone-derived growth factor-like protein.	1200	100
490	4851	gi5689491	Homo sapiens	KIAA1077 protein	4364	99
491	4872	gi5911953	Homo sapiens	hypothetical protein	3723	99
492	4902	B08917	Homo sapiens	Human secreted protein sequence encoded by gene 27	717	100
493	5006	gi435774	Homo sapiens	receptor tyrosine kinase isoform FLT4 long, FLT41 {C-terminal}	385	100
494	5007	Y93951	Homo sapiens	Amino acid sequence of a Brainiac-5 polypeptide.	804	100
495	5027	gi3548791	Homo sapiens	R33590_1	1606	100
496	5029	gi5689527	Homo sapiens	KIAA1095 protein	5722	99
497	5033	Y14482	Homo sapiens	Fragment of human secreted protein encoded by gene 17.	166	66
498	5040	Y95019	Homo sapiens	Human secreted protein vql_1,	258	92
499	5061	gi1304434	Pseudorabies virus	EPO	85	38
500	5081	gi4038081	Homo sapiens	vascular endothelial cell growth inhibitor	134	100
501	5129	gi3169158	Homo sapiens	BC269730_2	2340	99
502	5139	gi4062856	Homo sapiens	HEXIM1 protein	293	47
503	5174	gi93685	Homo sapiens	140up gene	576	90

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
		40		product		
504	524	G00329	Homo sapiens	Human secreted protein,	565	100
505	5291	Y92515	Homo sapiens	Human OXRE- 12.	1271	98
506	5335	gi72961 58	Drosophila melanogaster	CG3862 gene product	753	46
507	5346	Y94987	Homo sapiens	Human secreted protein vj1_1,	849	100
508	5379	gi71445 06	Homo sapiens	cytokine- inducible SH2- containing protein	1353	99
509	5441	gi80965 51	Homo sapiens	similar to mouse Ehm2	1516	100
510	549	Y22113	Homo sapiens	Human ZSMF-3 protein sequence.	294	62
511	5542	Y76267	Homo sapiens	Fragment of human secreted protein encoded by gene 11.	1066	100
512	5560	G03790	Homo sapiens	Human secreted protein,	103	36
513	5696	gi79203 98	Homo sapiens	PTOV1	1904	91
514	5704	B08930	Homo sapiens	Human secreted protein sequence encoded by gene 2	987	100
515	5758	W18878	Homo sapiens	Human protein kinase C inhibitor, IPKC-1.	368	100
516	5760	gi65621 76	Homo sapiens	hypothetical protein	425	100
517	5763	Y41706	Homo sapiens	Human PRO381 protein sequence.	441	100
518	5787	Y57907	Homo sapiens	Human transmembrane protein HTMPN- 31.	952	100

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Accession No.	Species	Description	Smith-Water man Score	% Identity
519	5823	gi98002 42	rat cytomegalovir us Maastricht	pr5	153	36
520	5886	gi17810 37	Mus musculus	neuronal tyrosine threonine phosphatase 1	1135	52
521	5924	W69221	Homo sapiens	Human parotid secretory protein.	710	96
522	5960	Y91529	Homo sapiens	Human secreted protein sequence encoded by gene 79	1300	99
523	5962	W69784	Homo sapiens	Protein Kinase C Inhibitor-like Protein (IPKC-2).	395	100
524	5969	Y79141	Homo sapiens	Human haemopoietic stem cell regulatory protein SCM113.	1205	79
525	5976	gi78031 0	Homo sapiens	natural killer associated transcript 4	1808	91
526	6002	gi21045 53	Homo sapiens		4367	67
527	6008	Y66765	Homo sapiens	Membrane-bound protein PRO1384.	822	100
528	6020	gi19115 48	Homo sapiens	cytochrome c-like polypeptide	322	50
529	6036	W71362	Homo sapiens	Human cytokine/stero id receptor protein.	353	51
530	6070	Y42750	Homo sapiens	Human calcium binding protein 1 (CaBP-1).	626	100
531	6075	gi10732 648	Homo sapiens	angiopoietin-like protein	2164	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				PP1158		
532	6106	gi2217970	Homo sapiens	p40	1349	96
533	6420	W82000	Homo sapiens	Human adult brain secreted protein dm26_2.	929	100
534	6434	gi10732648	Homo sapiens	angiopoietin-like protein PP1158	2164	100
535	6439	gi189701	Homo sapiens	endothelial cell growth factor	376	100
536	6463	Y41720	Homo sapiens	Human PRO792 protein sequence.	360	82
537	6466	gi4884084	Homo sapiens	hypothetical protein	538	100
538	6508	gi5442030	Homo sapiens	aminopeptidase	2317	96
539	6570	gi5921491	Homo sapiens		1591	99
540	6719	gi31847	Homo sapiens	glypican	1625	87
541	6772	Y65432	Homo sapiens	Human 5' EST related polypeptide	180	53
542	6789	gi537292	Homo sapiens	ICH-1L	1556	100
543	6805	gi4454702	Homo sapiens	HSPC007	634	84
544	6833	gi1890660	Homo sapiens	protein tyrosine phosphatase receptor omicron	5726	87
545	6834	gi5921491	Homo sapiens		1746	88
546	6851	gi2407641	Homo sapiens	neuropilin	3968	98
547	6868	gi6714641	Drosophila melanogaster	MAP kinase phosphatase	218	49
548	6876	Y13138	Homo sapiens	Human secreted protein encoded by 5' EST	414	76
549	688	Y73463	Homo sapiens	Human secreted protein clone	701	98

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				yk199_1 protein sequence		
550	6897	gi5815180	Homo sapiens	unknown	509	97
551	690	gi10645186	Homo sapiens	meningioma-expressed antigen 5s splice variant	522	100
552	6909	W78149	Homo sapiens	Human secreted protein encoded by gene 24 clone HSVBF78.	485	100
553	6924	Y35923	Homo sapiens	Extended human secreted protein sequence,	514	99
554	6937	G03798	Homo sapiens	Human secreted protein,	281	70
555	6951	gi511857	Homo sapiens	prostate-specific antigen	364	95
556	7008	G03200	Homo sapiens	Human secreted protein,	548	98
557	7009	Y22213	Homo sapiens	Human V201 protein sequence.	856	100
558	7057	gi6003654	Homo sapiens	brain specific membrane-anchored protein BSMAP	1814	100
559	7098	W27291	Homo sapiens	Human H1075-1 secreted protein 5' end.	712	100
560	7114	gi3212110	Homo sapiens	prefoldin subunit 1	534	98
561	712	gi4558641	Homo sapiens	P85B_HUMAN; PTDINS-3-KINASE P85-BETA	470	74
562	7215	gi4868366	Homo sapiens	delta-6 fatty acid desaturase	2437	100

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith-Waterman Score	% Identity
563	7244	Y12445	Homo sapiens	Human 5' EST secreted protein	428	100
564	7248	gi31137 6	Homo sapiens	Humig	633	100
565	7252	gi56895 31	Homo sapiens	KIAA1097 protein	5240	100
566	7292	gi51069 98	Homo sapiens	HSPC040 protein	580	100
567	7306	Y32201	Homo sapiens	Human receptor molecule (REC) encoded by Incyte clone 2057886.	1974	95
568	7338	Y73880	Homo sapiens	Human prostate tumor EST fragment derived protein #67.	1566	100
569	736	gi10178 317	Homo sapiens		1468	100
570	737	G00851	Homo sapiens	Human secreted protein,	522	98
571	740	W85610	Homo sapiens	Secreted protein clone eh80_1.	1115	87
572	7400	Y93948	Homo sapiens	Amino acid sequence of a lectin ss3939 polypeptide.	1982	98
573	7415	gi30436 70	Homo sapiens	KIAA0573 protein	2392	100
574	7429	Y40864	Homo sapiens	A human glutathione-S-transferase (hGST) protein.	1183	99
575	7458	Y53643	Homo sapiens	A bone marrow secreted protein designated BMS6.	554	99
576	7516	gi44683 11	Homo sapiens		1146	99
577	7526	gi41389 22	Homo sapiens	promyelocytic leukemia zinc finger	3571	99

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				protein; kruppel-like zinc finger protein; PLZF		
578	7571	G02915	Homo sapiens	Human secreted protein,	209	100
579	7614	W74726	Homo sapiens	Human secreted protein fg949_3.	1879	100
580	7663	gi5912548	Homo sapiens		1634	100
581	7686	gi4929711	Homo sapiens	CGI-121 protein	870	100
582	7714	gi388765	Homo sapiens	phospholipase D	4428	99
583	7724	G03933	Homo sapiens	Human secreted protein,	570	100
584	7834	gi8919166	Homo sapiens	mesenchymal stem cell protein DSC92	1133	100
585	7855	Y48505	Homo sapiens	Human breast tumour-associated protein 50.	684	100
586	7870	Y13372	Homo sapiens	Amino acid sequence of protein PRO223.	2559	100
587	7871	Y91689	Homo sapiens	Human secreted protein sequence encoded by gene 93	768	100
588	7892	gi34659	Homo sapiens	macrophage inflammatory protein-2alpha precursor	532	100
589	7927	gi32575	Homo sapiens		183	91
590	7944	gi1657458	Sus scrofa	calcium/calmodulin-dependent protein kinase II isoform gamma-B	2744	100
591	7947	G01131	Homo sapiens	Human	574	96

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
				secreted protein,		
592	800	gi3021428	Homo sapiens	neutral sphingomyelina se	167	68
593	8055	gi4929637	Homo sapiens	CGI-84 protein	1038	100
594	8082	gi4679014	Homo sapiens	HSPC014	715	100
595	8127	gi9955693	Homo sapiens	twisted gastrulation protein	905	95
596	8174	gi5532294	Homo sapiens	MUM2	767	100
597	8178	gi4530587	Homo sapiens	TADA1 protein	1132	100
598	8215	R66278	Homo sapiens	Therapeutic polypeptide from glioblastoma cell line.	830	100
599	8263	Y48371	Homo sapiens	Human prostate cancer- associated protein 68.	713	98
600	827	gi3172337	Cavia porcellus	phospholipase B	955	73
601	828	Y29517	Homo sapiens	Human lung tumour protein SAL-82 predicted amino acid sequence.	833	94
602	8294	gi4929767	Homo sapiens	CGI-149 protein	1085	100
603	8313	gi5771420	Homo sapiens	group IID secretory phospholipase A2	852	100
604	832	Y86260	Homo sapiens	Human secreted protein HELHN47,	319	78
605	8357	gi4191358	Mus musculus	claudin-7	164	47
606	8373	gi1945271	Homo sapiens	protein phosphatase 6	1666	100
607	8379	gi58529	Homo sapiens		1226	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
		81		cardiotrophin-like cytokine CLC		
608	8380	gi3402216	Homo sapiens	protein	974	100
609	8386	gi386988	Homo sapiens	oncostatin M	1297	99
610	8418	Y70210	Homo sapiens	Human TANGO 130 protein.	722	98
611	8442	G01895	Homo sapiens	Human secreted protein,	490	95
612	8457	G04048	Homo sapiens	Human secreted protein,	450	98
613	8458	W97119	Homo sapiens	S-adenosyl-L-methyltransferase (SAM-MT) protein.	1484	100
614	8469	gi7159799	Homo sapiens		255	100
615	8480	gi4589530	Homo sapiens	KIAA0943 protein	1998	100
616	8521	gi5726235	multiple sclerosis associated retrovirus element	unknown protein U5/2	250	82
617	857	gi9663958	Homo sapiens	cysteinyl leukotriene CysLT2 receptor	612	99
618	8574	gi6841260	Homo sapiens	HSPC305	1049	100
619	8606	gi3367707	Homo sapiens	scrapie responsive protein 1	544	100
620	8632	G01158	Homo sapiens	Human secreted protein,	502	100
621	8646	gi3882249	Homo sapiens	KIAA0764 protein	2175	100
622	8666	Y66196	Homo sapiens	Human bladder tumour EST encoded protein 54.	1080	95
623	8675	gi9963908	Homo sapiens	NPD009	432	96
624	8683	G04018	Homo sapiens	Human	469	98

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				secreted protein,		
625	8708	gi1633564	Homo sapiens	C8	364	98
626	8720	gi8248465	Homo sapiens	hepatocellular carcinoma-associated antigen 56A	191	69
627	8756	Y94984	Homo sapiens	Human secreted protein vell_1,	369	97
628	8765	Y00346	Homo sapiens	Fragment of human secreted protein encoded by gene 2.	1068	97
629	8783	Y27918	Homo sapiens	Human secreted protein encoded by gene No. 123.	1051	95
630	8804	Y25426	Homo sapiens	Human SIGIRR protein.	887	100
631	8838	Y99409	Homo sapiens	Human PRO1343 (UNQ698) amino acid sequence	1279	100
632	8851	W74785	Homo sapiens	Human secreted protein encoded by gene 56 clone HSAXS65.	454	100
633	8853	W75116	Homo sapiens	Human secreted protein encoded by gene 60 clone HILCJ01.	245	95
634	8857	gi2565196	Homo sapiens	non-functional folate binding protein	479	74
635	8859	Y02690	Homo sapiens	Human secreted protein encoded by gene 41c lone	600	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces- sion No.	Species	Description	Smith - Water man Score	% Identity
				HSZAF47.		
636	8901	Y86491	Homo sapiens	Human gene 59-encoded protein fragment,	548	99
637	8907	W88745	Homo sapiens	Secreted protein encoded by gene 30 clone HTSEV09.	2004	99
638	8934	W75088.	Homo sapiens	Human secreted protein encoded by gene 32 clone HAGBB70.	421	98
639	8960	Y02693	Homo sapiens	Human secreted protein encoded by gene 44 clone HTDAD22.	267	72
640	8979	Y76143	Homo sapiens	Human secreted protein encoded by gene 20.	1374	98
641	8980	Y11433	Homo sapiens	Human 5' EST secreted protein	466	100
642	8986	G02626	Homo sapiens	Human secreted protein,	306	100
643	8987	G02093	Homo sapiens	Human secreted protein,	486	97
644	8995	Y12908	Homo sapiens	Human 5' EST secreted protein	181	100
645	9035	Y71108	Homo sapiens	Human Hydrolase protein-6 (HYDRL-6).	800	100
646	9062	gi8886005	Homo sapiens	lysophosphatid ic acid acyltransferas e-delta	523	100
647	9074	Y25761	Homo sapiens	Human	1366	99

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
				secreted protein encoded from gene 51.		
648	9075	Y73336	Homo sapiens	HTRM clone 1852290 protein sequence.	1591	100
649	9098	Y57878	Homo sapiens	Human transmembrane protein HTMPN-2.	516	100
650	9109	gi23903	Homo sapiens	63kDa protein kinase	1141	97
651	911	gi32456	Homo sapiens	protein-tyrosine phosphatase	2591	100
652	912	gi11367 43	Homo sapiens	human P5	212	46
653	9163	Y34129	Homo sapiens	Human potassium channel K+Hnov28.	377	71
654	9164	Y41324	Homo sapiens	Human secreted protein encoded by gene 17 clone HNFIY77.	1083	99
655	9173	gi68512 56	Mus musculus	protein tyrosine phosphatase-like protein PTPLB	631	93
656	9187	Y66721	Homo sapiens	Membrane-bound protein PRO511.	1173	95
657	9190	W40378	Homo sapiens	Human breast cancer protein CH14-2a16-1 from 2.0 kB DNA fragment #2.	792	81
658	9194	Y02781	Homo sapiens	Human secreted protein.	462	70
659	9210	G02994	Homo sapiens	Human secreted protein,	166	80

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Waterman Score	% Identity
660	9222	G02520	Homo sapiens	Human secreted protein,	186	43
661	9230	gi6706554	Homo sapiens	inositol 1,4,5-trisphosphate 3-kinase B	1315	95
662	9258	gi522145	Homo sapiens	B-cell growth factor	120	56
663	9260	G04072	Homo sapiens	Human secreted protein,	138	51
664	9271	gi6690095	Homo sapiens	tetraspanin protein	317	67
665	9272	gi163042	Bos taurus	factor activating exoenzyme S	444	72
666	9275	gi401774	Homo sapiens	ribosomal protein S6 kinase 3	424	81
667	930	G02355	Homo sapiens	Human secreted protein,	167	41
668	9304	gi8979743	Canis familiaris	Band4.1-like5 protein	1493	93
669	9346	gi2738989	Mus musculus	high mobility group protein homolog HMG4	384	89
670	9347	gi36613	Homo sapiens	serine/threonine protein kinase	199	91
671	935	gi5541870	Homo sapiens	QA79 membrane protein, allelic variant airm-1b	334	57
672	9350	gi3327124	Homo sapiens	KIAA0655 protein	757	87
673	9351	W57260	Homo sapiens	Human semaphorin Y.	573	95
674	9356	gi59977	Human endogenous retrovirus	tripartite fusion transcript PLA2L	127	59
675	9363	Y17834	Homo sapiens	Human PRO361 protein sequence.	968	92
676	9366	gi72431	Homo sapiens	KIAA1374	649	96

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Accession No.	Species	Description	Smith - Water man Score	% Identity
	29			protein		
677	9369	G03793	Homo sapiens	Human secreted protein,	222	69
678	9378	gi44683 11	Homo sapiens		163	39
679	9393	gi27389 89	Mus musculus	high mobility group protein homolog HMG4	384	89
680	9444	G01399	Homo sapiens	Human secreted protein,	157	93
681	9467	gi44547 02	Homo sapiens	HSPC007	230	71
682	9486	gi10047 243	Homo sapiens	KIAA1584 protein	605	93
683	949	Y30895	Homo sapiens	Human secreted protein fragment encoded from gene 25.	704	99
684	9499	W36002	Homo sapiens	Human Fchd531 gene product.	2173	96
685	9510	gi16657 99	Homo sapiens		867	83
686	9523	Y53022	Homo sapiens	Human secreted protein clone qf116_2 protein sequence	1252	89
687	9534	Y66670	Homo sapiens	Membrane-bound protein PRO1180.	998	100
688	9539	Y76144	Homo sapiens	Human secreted protein encoded by gene 21.	633	100
689	954	G02490	Homo sapiens	Human secreted protein,	160	78
690	9546	gi18112 1	Homo sapiens	chorionic somatomammotro pin	616	96
691	955	gi72431 03	Homo sapiens	KIAA1361 protein	2042	100
692	9551	gi17723	Homo sapiens	ras-related	341	57

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Acces-sion No.	Species	Description	Smith-Water man Score	% Identity
		45		GTP-binding protein		
693	9558	W88403	Homo sapiens	Human adult testis secreted protein ga63_6.	2252	100
694	9561	gi6690017	Herpesvirus papio	NTR	100	30
695	957	Y86260	Homo sapiens	Human secreted protein HELHN47,	319	78
696	9572	gi972940	Mus musculus	Elf-1	806	92
697	9576	gi3249005	Homo sapiens	geminin	448	98
698	9586	gi2887288	Homo sapiens	mRNA cleavage factor I 25 kDa subunit	208	100
699	9587	G00995	Homo sapiens	Human secreted protein,	726	99
700	9592	gi495273	Rattus norvegicus	ribosomal protein S15a	202	78
701	9595	gi7799912	Homo sapiens	UBASH3A protein	453	47
702	9610	Y07875	Homo sapiens	Human secreted protein fragment encoded from gene 24.	574	100
703	9634	Y73325	Homo sapiens	HTRM clone 001106 protein sequence.	820	99
704	9639	G00805	Homo sapiens	Human secreted protein,	155	67
705	9647	G03786	Homo sapiens	Human secreted protein,	196	73
706	9653	gi3882341	Homo sapiens	KIAA0810 protein	523	100
707	9654	G01924	Homo sapiens	Human secreted protein,	469	100
708	9678	Y99376	Homo sapiens	Human PRO1244 (UNQ628) amino	474	100

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				acid sequence		
709	9709	Y11825	Homo sapiens	Human 5' EST secreted protein	657	100
710	9722	gi7677422	Mus musculus	GTPase Rab37	189	75
711	9731	Y12424	Homo sapiens	Human 5' EST secreted protein	207	100
712	9742	Y57954	Homo sapiens	Human transmembrane protein HTMPN-78.	484	100
713	9749	gi3687829	Homo sapiens	hT41	386	65
714	9755	gi2055295	Homo sapiens	Similar to a C.elegans protein in cosmid C14H10	2583	100
715	9762	G03436	Homo sapiens	Human secreted protein,	176	61
716	9763	gi6180011	Homo sapiens	anaphase-promoting complex subunit 4	1016	100
717	9784	G03570	Homo sapiens	Human secreted protein,	401	96
718	9794	G00803	Homo sapiens	Human secreted protein,	333	69
719	9795	gi2516242	Mus musculus	Rab33B	669	94
720	9798	gi558599	Homo sapiens	ZID, zinc finger protein with interaction domain	605	96
721	9805	Y25881	Homo sapiens	Human secreted protein fragment encoded from gene 61.	566	96
722	9816	gi532056	Homo sapiens	protein-tyrosine-phosphatase	384	100
723	9830	G00857	Homo sapiens	Human	539	96

SEQ ID NO:	SEQ ID NO: in USSN 09/488,725	Accession No.	Species	Description	Smith-Waterman Score	% Identity
				secreted protein,		
724	9836	G00914	Homo sapiens	Human secreted protein,	527	100
725	9837	gi2662099	Homo sapiens	KIAA0409	230	67
726	984	Y29517	Homo sapiens	Human lung tumour protein SAL-82 predicted amino acid sequence.	833	94
727	9849	gi7229305	Homo sapiens	ZNF264, partial cds	140	90
728	9851	gi5262560	Homo sapiens	hypothetical protein	369	64
729	9859	gi3881976	Homo sapiens	hypothetical protein	167	93
730	9863	gi7295707	Drosophila melanogaster	CG15433 gene product	837	78
731	9888	gi3319677	Homo sapiens		209	72
732	989	gi4557143	Rattus norvegicus	zinc finger protein RIN ZF	604	92
733	9919	G01843	Homo sapiens	Human secreted protein,	586	100
734	9922	W67869	Homo sapiens	Human secreted protein encoded by gene 63 clone HHGDB72.	551	93
735	9947	W78239	Homo sapiens	Fragment of human secreted protein encoded by gene 3.	251	78
736	9956	Y36203	Homo sapiens	Human secreted protein #75.	273	77
737	9961	Y99357	Homo sapiens	Human PRO1190 (UNQ604) amino acid sequence	650	99
738	9972	Y12149	Homo sapiens	Human 5' EST secreted protein	284	100
739	9977	gi10039	Homo sapiens	osteoblast	822	98

SEQ ID NO:	SEQ ID NO: in USSN 09/48 8,725	Acces- sion No.	Species	Description	Smith- Water man Score	% Identity
		439		differentiatio n promoting factor		

Table 3 - Amino Acids

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corre- sponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corre- sponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
1	740	2	557	FVGRLLRLGEALRLRPDPSGGCRLQPALVGETEMSEKENNFPP LPKFIPVKPCFYQNFSDEIPVEHQVLVKRIYRLWMFYCATLGV NLIACLAWWIGGGSGTNFGLAFVWLLLFTPCGYVCWFRPVYKA FRADSSFNFMAFFFIFRSPVCPDRHPGDWLLRLGRVRLAVGNW ILPVQPGRCRGHA
2	741	305	838	FLGAGADIFCAYLRMSSKQATSPFACAADGEDAMTQDLTSREK EEGSDQHVASHLPLHPIMHNKPHSEELPTLVSTIQQDADWDSV LSSQQRMESENNKLCSLYSFRNTSTSPHKPDEGSRDREIMTSV TFGTPERRKGSLADVVDTLKQKKLEEMTRTEQEDSSCMEKLLS KDWKE
3	742	12	1315	EGYLTGRPTRPVAVRGKSTADLRMMGRSPGFAMQHIVGVPHVL VRRGLLGRDLFMTRTLCSPGPSQPGEKRPEEVALGLHHRLPAL GRALGHSIQQRATSTAKTWWDRYEEFVGLNEVREAQGKVTEAE KVFMVARGLVREAREDLEVHQAKLKEVRDRLDRVSREDSQYLE LATLEHRMLQEEKRLRTAYLRAEDSEREKFSLFSAAVRESHEK ERTRAERTKNWSLIGSVLGALIGVAGSTYVNRVRLQELKALLL EAQKGPVSLQEAIREQASSYSRQQRDLHNLMVDLRGLVHAAGP GQDSGSQAGSPPTRDRDVDVLSAALKEQLSHSRQVHSCLEGLR EQLDGLEKTCSQMAGVVQLVKSAAHPGLVEPADGAMPSFLLEQ GSMILALSDTEQRLEAQVNRNTIYSTLVTCVTFVATLPVLYML PKAS
4	743	112	745	NLPPLTPQPGPRLAGSGPSHWFSPLSLPVASKAPGTMAQALGE DLVQPPELQDDSSSLGSDSELSGPGPYRQADRYGFIGGSSAEP GPGHPPADLIRQREMKWVEMTSHWEKTMSRRYKKVKMQCRKGI PSALRARCWPLLCGAHVCQKNSPGTYQELAEAPGDPQWMETIG RDLHRQFPLHEMFVSPQGHGQQGLLQVLKAYTLYRPEQG
5	744	99	265	LRGMAAAAAGPAASQRFFQSFSDALIDQDPQAALEVGEPFLLP PLPADPPPSSTA

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6	745	210	758	WACFRSAHCSRHLRNRIFMYLYWDKTRSPVCKGPALREERPQP RLKLEDYKDRLKSGEHLNPDQLEAVEKYEEVLHNLEFAKELQK TFSGLSLDLLKAQKKAQRREHMLKLEAEKKKLRTILQVQYVLQ NLTQEHVQKDFKGGLNGAVYLPSKELDYLIKFSKLTCPERNES LRQTLEGSTV
7	746	48	450	XAGVQMKLEFLQRKFWAATRQCSTVDGPCTQSCEDSDLDCFVI DNNGFILISKRSRETGRFLGEVDGAVLTQLLSMGVFSQVTMYD YQAMCKPSSHHHSAAQPLVSPISAFLTATRWLLQELVLFLLEW SVWGSX*
8	747	1	469	CRGRLAQLEEAAVAATMSAGDAVCTGWLVKSPPERKLQRYAWR KRWFVLRRGRMSGNPDVLEYYRNKHSSKPIRVIDLSECAVWKH VGPSFVRKEFQNNFVIVKTTSRTFYLVAKTEQEMQVWVHSIS QVCNLGHLEDGAADSMESLSYTRSYLQ
9	748	242	409	IPAVPLTSCVTVGSYSLSVRDYDPRQGDTVKHYKIRTL\DKRG FYISP\RSTFSTLQ
10	749	1	1146	KDSVLNIARGKKYGEKTKRVSSRKKPALKC/TSQKQPALKAIC DKEDSVPNTATEKKDEQISGTVSSQKQPALKATSDKKDSVSNI PTEIKDGQQSGTVSSQKQPAWKATSVKKDSVSNIATEIKDGQI \RGTVSSQRQPALKA\TGDEKDSVSNIAREIKDGEKSGTVSPQ KQSAQKVIFKKKVSLLNIATRITGGWKSGTEYPENLPTLKATI ENKNSVLNTATKMKDVQTSTPEQDLEMASEGEQKRLEEYENNQ PQVKNQIHSRDDLDDIIQSSQTVSEDGDSLCCNCKNVILLIDQ HEMKCKDCVHLLKIKKTFCLCKRLTELKDNHCEQLRVKIRKLK NKASVLQKRLSEKEEIKSQLKHETLELEKELCSLRFAIQQ
11	750	3	892	SPLRYRAGQSGSTISSSSCAMWRCGGRQGLCVLRRLSGGHAHH RAWRWNSNRACERALQYKLGDKIHGFTVNQVTSVPELFLTAVK LTHDDTGARYLHLAREDTNNLFSVQFRTTPMDSTGVPHILEHT VLCGSQKYPCRDPFFKMLNRSLSTFMNAFTASDYTLYPFSTQN PKDFQNLLSVYLDATFFPCLRELDFWQEGWRLEHENPSDPQTP LVFKGVVFNEMKGAFTDNERIFSQHLQNRLLPDHTYSVVSGGD PLCIPELTWEQLKQFHATHYHPSNARFFTYGNFPLDQH
12	751	367	856	RGAKAKSAVLPPGPPCSSILILSPPAPLTPRSPGTEATRPTAM SKSLKKKSHWTSKVHESVIGRNPEGQLGFELKGGAENGQFPYL GEVKPGKVAYESGSKLVSEELLLEVNETPVAGLTIRDVLAVIK HCKDPLRLKCVKQGESSGLLSVLPGGGTARGAGQ
13	752	144	442	SHRPQPDAWRQGNAFQCVQKEKMQVSSAEVRIGPMRLTQDPIQ VLLIFAKEDSQSDGFWWACDRAGYRCNIARTPESALECFLDKH HEIIVIDHRQTQN
14	753	1	581	FRLAGCGHLLVSLLGLLLLLARSGTRALVCLPCDESKCEEPRN CPGSIVQGVCGCCYTCASQRNESCGGTFGIYGTCDRGLRCVIR PPLNGDSLTEYEAGVCEDENWTDDQLLGFKPCNENLIAGCNII NGKCECNTIRTCSNPFEFPSQDMCLSALKRIEEEKPDCSKARC EVQFSPRCPEDSVLIEGYAPP

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15	754	1	219	FRMAANVGSMFQYWKRFDLQQLQRELDATATVLANRQDESEQS RKRLIEQSREFKKNTPEVRRVTIVFALKGS
16	755	313	562	ETLSCRIMDHPSREKDERQRTTKPMAQRSAHCSRPSGSSSSSG VLMVGPNFRVGKKIGCGNFGELRLGEGLPQVYYFGPCGKY
17	756	273	574	GCCKD*HSGVIGRSWAMLFASGGFQVKLYDIEQQQIRNALENI RWASRRSPEGMEVGLFLSVGLVCHILKAMRICDVTFSSDGYCS ASELVKARPTVAGM
18	757	3	390	NSRVDDFVSARPKPRPLPRARGMVVVTGREPDSRRQDGAMSSS DAEDDFLEPATPTATQAGHAL/PPAAT/GSFLRLFPLTSEGLT SLHACPHCGATKTPCWQPCSVGGTTSPRTPRAGTSSTEMAHTL EMC
19	758	98	461	RALWVGGCSGEACGIGMSGLLTDPEQRAQEPRYPGFVLGLDVG SSVIRCHVYDRAARVCGSSVQKVENLYPQIGWVEIDPDVLWIQ FVAVIKEAVKAAGIQMNQIVGLGISTQRATFITWN
20	759	100	731	GLAAEQSMQFVKLWCGCSGEFPTRLRRRTPLTEAMEGGPAVCC QDPRAELVERVAAIDVTHLEEADGGPEPTRNGVDPPPRARAAS VIPGSTSRLLPARPSLSARKLSLQERPAGSYLEAQAGPYATGP ASHISPRAWRRPTIESHHVAISDAEDCVQLNQYKLQSEIGKGA YGVVRLAYNESEDRHYAMKVLSKKKLLKQYGFPRRPPP
21	760	2	520	FVYGKPVTLWPTISSVVPSTFLGLGNYEVEVEAEPDVRGPEIV TMGENDPPAVEAPFSFRSLFGLDDLKISPVAPDADAVAAQILS LLPLKFFPIIVIGIIALILALAIGLGIHFDCSGKYRCRSSFKC IELIARCDGVSDCKDGEDEYRCVRVGGQNAALQVFTAASRKTM
22	761	158	470	SLAMPFGCVTLGDKKNYNQPSEVTDRYDLGQVIKTEEFCEIFR AKDKTTGKLHTCKKFQKRDGRKVRKAAKNEIGILKMVKHPNIL QLVDVFVTRKEYFIFLEL
23	762	1	749	QRRRFRAGLWGGHGLTDGLRRNGGCGCSARVPRVGERLRGHRC PDPLCLLLDMLFLSFHAGSWESWCCCCLIPADRPWDRGQHWQL EMADTRSVHETRFEAAVKVIQSLPKNGSFQPTNEMMLKFYSFY KQATEGPCKLSRPGFWDPIGRYKWDAWSSLGDMTKEEAMIAYV EEMKKIIETMPMTEKVEELLRVIGPFYEIVEDKKSGRSSDITS DLGNVLTSTPNAKTVNGKAESSDSGAESEEEEAC
24	763	3	558	SCFKGRTGGRSGSSGDSSRWARCGRHFSASTEEPPLSQPCSAL PRSGRRGCAVPSSVTKMLSFFRRTLGRRSMRKHAEKERLREAQ RAATHIPAAGDSKSIITCRVSLLDGTDVSVDLPKKAKGQELFD QIMYHLDLIESDYFGLRFMDSAQVAHWLDGTKSIKKQVKIGSP YCLHLRVKFYSS
25	764	9	424	ESRERSGNRRGAEDRGTCGLQSPSAMLGAKPHWLPGPLHSPGL PLVLVLLALGAGWAQEGSEPVLLEGECLVVCEPGRAAAGGPGG AALGEAPPGRVAFAAVRSHHHEPAGETGNGTSGAIYFDQVLVN EGGGFDRAS

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26	765	2	507	EDVKSYYTVHLPQLENINSGETRTISHFHYTTWPDFGVPQSPA SFLNFLFKVRESGSLNPDHGPVVIHRSAGTGRSSTFSVVHTCL VLMEKGDDINIKQVLLNIRKFQMGLI\QTPDQLRFSYMAITEG AKCVKGDSSIQKRWKELSKE/DLPPAFDHSPNKIMTEKYNR
27	766	84	852	LNRQRCGDQVLVPGTGLAAILRTLPMFHDEEHARARGLSEDTL VLPPASRNQRILYTVLECQPLFDSSDMTIAEWVCLAQTIKRHY EQYHGFVVIHGTDTMAFAASMLSFMLENLQKTVILTGAQVPIH ALWSDGRENLLGALLMAGQYVIPEVCLFFQNQLFRGNRATKVD ARRFAAFCSPNLLPLATVGADITINRELVRKVDGKAGLVVHSS MEQDVGLLRLYPGIPAALVRAFLQPPLKGVVMETFGSGNG
28	767	992	210	LFRLAPGFLRSLARQGYHQIWAFPFLPSGATATWPAASRSRSL AARSLPRSPARPGPNDALLGEHDFRGQGVRAQRFRFSEEPGPG ADGAVLEVHVPQIGAGVSLPGILAAKCGAEVILSDSSELPHCL EVCRQSCQMNNLPHLQVVGLTWGHISWDLLALPPQDIILASDV FFEPEDFEDILATIYFLMHKNPKVQLWSTYQVRSADWSLEALL YKWDMKCVHIPLESFDADKEDIAESTLPGRHTVEMLVISFAKD SL
29	768	23	624	SFIYKHTHRARFGPRAIVASPALTAGPHVSLTASCRVGMWVSC SPSPFLHPTNTLVAVLERDTLGIREVRLFNAVVRWSEAECQRQ QLQVTPENRRKVLGKALGLIRFPLMTIEEFAAGNRARAQGLVW EGSGTQVGIW/CTEDSAPEFTAESLADAWHIQIGRNLACEDAS T/WAIC*PRPGSVPTVHTARPRLSCLSSCF
30	769	100	2	MASTQDAELAVSRXRAIALXPGXQSXXPSQKKK
31	770	158	1957	LLKSCGVLLSGVCIPCEGKGPTVLVIQTAVPQDRPTKSSMRSA AAKPWNPAIRAGGHGPDRVRPLPAASSGMKSSKSSTSLAFESRL SRLKRASSEDTLNKPGSTAASGVVRLKKTATAGAISELTESRL RSGTGAFTTTKRTGIPAPREFSVTVSRERSVPRGPSNPRKSVS SPTSSNTPTPTKHLRTPSTKPKQENEGGEK\VRLSPK/FRELL AEAKAKDSEINRLRSELKKYKEKRTLNAEGTDALGPNVDGTSV SPGDTEPMIRALEEKNKNFQKELSDLEEENRVLKEKLIYLEHS PNSEGAASHTGDSSCPTSITQESSFGSPTGNQLSSDIDEYKKN IHGNALRTSGSSSSDVTKASLSPDASDFEHITAETPSRPLSST SNPFKSSKCSTAGSSPNSVSELSLASLTEKIQKMEENHHSTAE ELQATLQELSDQQQMVQELTAENEKLVDEKTILETSFHQHRER AEQLSQENEKLMNLLQERVKNEEPTTQEGKIIELEQKCTGILE QGRFEREKLLNIQQQLTCSLRKVEEENQGALEMIKRLKEENEK LNEFLELERHNNNMMAKTLEECRVTLEGLKMENGSLKSHLQG
32	771	203	514	SQMHRLIFVYTLICANFCSCRDTSATPQSASIKALRNANLRRD ESNHLTDLYRRDETIQVKGNGYVQSPRFPNSYPRNLLLTWRLH SQENTRIQLVFDNQFGL

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33	772	59	713	PFKKMTDLLRSVVTVIDVFYKYTKQDGECGTLSKGELKELLEK ELHPVLKNPDDPDTVDVIMHMLDRDHDRRLDFTEFLLMIFKLT MACNKVLSKEYCKASGSKKHRRGHRHQEEESETEEDEEDTPGH KSGYRHSSWSEGEEHGYSSGHSRGTVKCRHGSNSRRLGRQGNL SSSGNQEGSQKRYHRSSCGHSWSGGKDRHGSSSVELRERINKS HIK
34	773	209	601	VPKISGPDHIDFIPWDQLFMASSSSVTEFLVLGFSSLGELQLV LFAVFLCLYLIILSGNIIIISVIHLDHSLHTPMYFFLGILSIS EIFYTTVILPKMLINLFSVFRTLSFVSCATQMFYEIVGPGTQE R
35	774	373	987	DHSTETPGIPAAEPVSHGTGKLERAPTLPAGAELPAPAAVPCP TL*VC/LYPQLLGLSVATMVTLTYFGAHFAVIRRASLEKNPYQ AVHQWGTQQRLIQHPESGSEGQSLLGPLRAFSAGLSLVGLLTL GAVLSAAATVREAQGLMAGGFLCFSLAFCAQVQVVFWRLHSPT QVEDAMLDTYDLVYEQAMKGTSHVRRQELAAIQ
36	775	102	466	QPGYSEYDKNRGQGMLLNMMCGRQLSAISLCLAVTFAPLFNAQ ADEPEVIPGDSPVAVSEQGEALPQAQATAIMAGIQPLPEGAAE KARTQIESQLPAGYKPVYLNQLQLLYAARGISCSV
37	776	2	430	RTRAADVYVFSLTGKSRNVSSSTVRRSAVGGMSALALFDLLKP NYALATQVEFTDPEIVAEYITYPSPNGHGEVRGYLVKPAKMSG KTPAVVVVHENRGLNPYIEDVARRVAKAGYIALAPDGLSSVGG YPGNDIKVVSAAA
38	777	106	556	VKQRHGNSLLTTETKCISCRLGVPLSPQRRFQAIRIEEVKLRW FAFLIVLLAGCSSKHDYTNPPWNAKVPVQRAMQWMPISQKAGA AWGVDPQLITAIIAIESGGNPNAVSKSNAIGLMQLKASTSGRD VYRRMGWSGEPTTSELKNSSR
39	778	3	892	HAAGIRHEAKPKRSFYAARDLYKYRHQYPNFKDIRYQNDLSNL RFYKNKIPFKPDGVYIEEVLSKWKGDYEKLEHNHTYIQWLFPL REQGLNFYAKELTTYEIEEFKKTKEAIRRFLLAYKMMLEFFGI KLTDKTGNVARAVNWQERFQHLNESQHNYLRITRILKSLGELG YESFKSPLVKFILHEALVENTIPNIKQSALEYFVYTIRDRRER RKLLRFAQKHYTPSENFIWGPPRKEQSEGSKAQKMSSPLASSH NSQTSMHKKAKDSKNSSSAVHLNSKTAEDKKVAPKEPV
40	779	123	395	ELQVFQPIGGMSDSGSQLGSMGSLTMKSQLQITVISAKLKENK KNWFGPSPYVEVTVDGQSKKTEKCNNTNSPKWKQPLTVIVTPV SKLH
41	780	173	438	IETLSFVIRNWNTHAMSKPIVMERGVKYRDADKMALIPVKNVA TEREALLRKPEWMKIKLPADSTRIQGIKAAMRKNGLHSVCEEA SC
42	781	287	393	PRMVLGKPQTDPTLEWFLSHCHIHKYPSKSTLIPQ
43	782	119	556	GLRISVQERIKACFTESIQTQIAAAEALPDAISRAAMTLVQSL LNGNKILCCGNGTSAANAQHFAASMINRFETERPSLPAIALNT DNVVLTAIANDRLHDEVYAKQVRALGHAGDVLLAISTRGNSRD IVKAVEAAVTRDTTIV

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44	783	248	554	KQTQHAPGMMKKYLALALIAPLLISCSTTKKGDTYNEAWVKDT NGFDILMGQPAHNIENIWGFKEVVIAGPKDYVKYTDQYQTRSH INFDDGTITIEPIPGT
45	784	77	311	TDRTALNPGQESAMNRLFSGRSDMPFALLLLAPSLLLLGGLVA WPMVSNIEISFLRLPLNPNIESTFVGVSNYVRILS
46	785	184	627	KELVDEKSERGRAMDPVSQLASAGTFRVLKEPLAFLRALELLF AIFAFATCGGYSGGLRLSVDCVNKTESNLSIDIAFAYPFRLHQ VTFEVPTCEGKERQKLALIGDSSSSAEFFVTVAVFAFLYSLAA TGRYIFFHNKNRENNRGPL
47	786	3	742	LGTVSYGADTMDEIQSHVRDSYSQMQSQAGGNNTGSTPLRKAQ SSAPKVRKSVSSRIHEAVKAIVLCHNVTPVYESRAGVTEETEF AEADQDFSDENRTYQASSPDEVALVQWTESVGLTLVSRDLTSM QLKTPSGQVLSFCILQLFPFTSESKRMGVIVRDESTAEITFYM KGADVAMSPIVQYNDWLEEECGNMAREGLRTLVVAKKALTEEQ YQDFEVSRLPGIPSSYDGAFLTLKLVLPVFV
48	787	864	335	EGPHR\RLFQMVKA/LQEAPEDPNQILIGYSRGLVVIWDLQGS RVLYHFLSSQQLENIWWQRDGRLLVSCHSDGSYCQW\PVSSEA QQPEPLRSLVPYGPFPCKAITRILWLTTRQGLPFTIFQGGMPR ASYGDRHCISVIHDGQQTAFDFTSRVIGFTVLTEADPAASRRA SGVGAQG
49	788	410	951	KQGLEVRDLHFKEITSGRALLRVACKRPSMVPGGQLQRAGAGA QARITGLSPALWGARVHGWIPELPAGLPPGACLWPLIPACPSR HWGWVSAPVKG/WAQAILGLALCL/RGEHRGLGAGVSKVRSLK MDRKVWTETLIEVGMPLLATDTWGLPHSTAVWVSQPPPYLSDH STLELERDPL
50	789	1	437	LSCNSEQALLSLVPVQRELLRRRYQSSPAKPDSSFYKGLGTCP SQLRLSEPPPTPRHLSVASVSHHMFPSHRSLCPHLPDFFAAPF PSDNLPYTLQSPFPSPPPATPSDHALILHH\DLNGGPDDPLQQ TGQLFGGLVRDIRRRYP
51	790	1	198	SPSSKLVGMWWAGRAGSSRTTSVSLLCLP/SAPFGASNLLVNP LEPQNADKIKIKIADLGNACWVV
52	791	3	435	RVDPRVRAPRCGDKIKNHMY\KCDCGSLKDCASDRCCETSCTL SLGSVCNTGLCCHKCKYAAPGVVCRDLGGICDLPEYCDGKKEE CPNDIYIQDGTPCSAVSVCIRGNCSDRDMQCQALFGYQVKDGS PACYRKLNRIGNRFGT
53	792	1	728	PGRPTRPDASLAQ/DPRTTMFRIPEFKWSPMHQRLLTDLLFAL ETDVHVWRS\HSTKSVMDFVNSNENIIFVHNTIHLISQMVDNI IIACGGILPLLSAATSPTGSKTELENIEVTQGMSAETAVTFLS RLMAMVDVLVFASSLNFSEIEAEKNMSSGGLMRQCLKLVCCVA VRNCLECRQRQRDRGNKSSHGSSKPQEVPQSVTATAASKTPLE NVPGNLSPIKDPDRLLQDVDINRLRAVVF

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54	793	2230	990	NSSGVKLLQALGLSPGNGKDHSILHSRNDLEEAFIHFMGKGAA AERFFSDKETFHDIAQVASEFPGAQHYVGGNAALIGQKFAANS DLKVLLCGPVGPKLHELLDDNVFVPPESLQEVDEFHLILEYQA GEEWGQLKAPHANRFIFSHDLSNGAMNMLEVFVSSLEEFQPDL GGLSGLHMMEGQSKELQRKRLLEVVTSISDIPTGIPV\HLELG \SMTNRELMSSIV\LQQVFPAVTSLGLNEQELLFLTQSASGPH SSLSSWNGVPDVGMVSDILFWILKEHGRSKSRASDLTRIHFHT LVYHILATVDGHWANQLAAVAAGARVAGTQACATETIDTSRVS LRAPQEFMTSHSEAGSRIVLNPNKPVVEWHREGISFHFTPVLV CKDPIRTVGLGDAISAEGLFYSEVHPHY
55	794	249	3	DDSSGWGLEQLVVRWSLALWPRLECSGMISAHCNLCL/LGSSD SPASAPRVAGITDVCHHAWLVFVFLVVMGFPHVGHVGLELL
56	795	2	1176	LGEVLKCQQGVSSLAFALAFLQRMDMKPLVVLGLPAPTAPSGC LSFWEAKAQLAKSCKVLVDALRHNAAAAVPFFGGGSVLRAAEP APHASYGGIVSVETDLLQWCLESGSIPILCPIGETAARRSVLL DSLEVTASLAKALRPTKIIFLNNTGGLRDSSHKVLSNVNLPAD LDLVCNAEWVSTKERQQMRLIVDVLSRLPHHSSAVITAASTLL TELFSNKGSGTLFKNAERMLRVRSLDKLDQGRLVDLVNASFGK KLRDDYLASLRPRLHSIYVSEGYNAAAILTMEPVLGGTPYLDK FVVSSSRQGQGSGQMLWECLRRDLQTLFWRSRVTNPINPWYFK HSDGSFSNKQWIFFWFGLADIRDSYELVNHAKGLPDSFHKPAS DPGS
57	796	755	374	YHAPALQPGQQSKTLSQEKKNFFRPGAVAHTCNPSTLGGRGGR ITRSGDRDHPG*HGETPSLLKIQKKLAGRDGGRL*SQLLGRLR QENGVNPGGGGCSEPRLRHCTPAW*QSETISRKKRKKERKY
58	797	2	476	FRPIGIIRQALCSADGHQRRILTLRLGLLVIPFLPASNLFFRV GFVVPSVGCCVMLLFGFG/ALRKHTEKKKLIAAVVLGILLS/N DAERLRCAVRGGEWRSE/EAVFRGAVSVCPLSAEVRCNIGRNL AAKGNQTGAIRYHREAVSLNPKTKSSTREFRPC
59	798	3	711	KIADFGFSNLFTPGQLLKTWCGSPPYAAPELFEGKEYDGPKVD IWSLGVVLYVLVCGALPFDGSTLQNLRARVLSGKFRIPFFMST ECEHLIRHMLVLDPNKRLSMEQICKHKWMKLGDADPNFDRLIA ECQQLKEERQVDPLNEDVLLAMEDMGLDKEQTLQSLRSDAYDH YSAIYSLLCDRHKRHKTLRLGALPSMPRALGLSSTSQYP\AEQ AGTAMNISVPQVQLINPENQIV
60	799	2	344	AREFLGHRASITWS*ARVHHRFPKAEVA*P/SLLRTDLTEDRT KCCHGDLLECADDRADLVEDIWENQDSISTILIECCEKPLLEK SHCIAEVENDEMPADLPSLAADFVESKDV

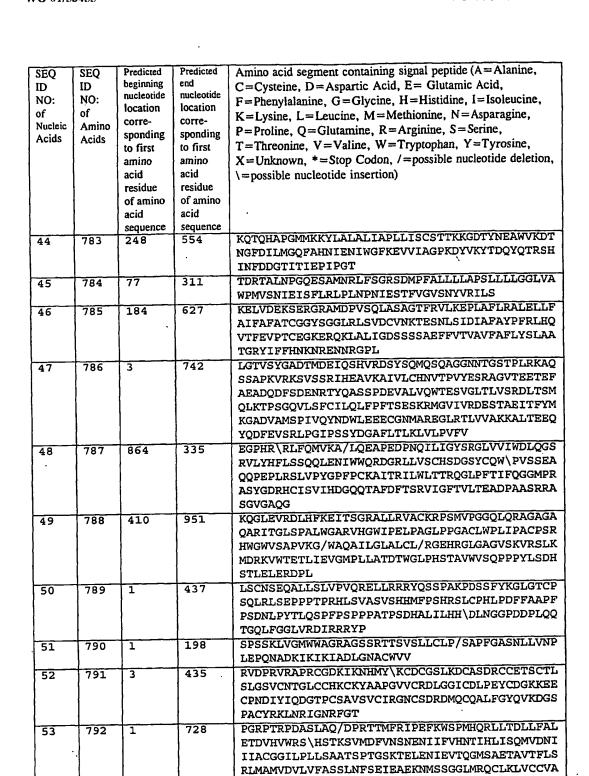| SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corre-sponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corre-sponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A = Alanine, C = Cysteine, D = Aspartic Acid, E = Glutamic Acid, F = Phenylalanine, G = Glycine, H = Histidine, I = Isoleucine, K = Lysine, L = Leucine, M = Methionine, N = Asparagine, P = Proline, Q = Glutamine, R = Arginine, S = Serine, T = Threonine, V = Valine, W = Tryptophan, Y = Tyrosine, X = Unknown, * = Stop Codon, / = possible nucleotide deletion, \ = possible nucleotide insertion)
61	800	142	594	VPPKMKRGTSLHSRRGKPEAPKGSPQINRKSGQEMTAVMQSGR PRSSSTTDAPTGSAMMEIACAAAAAAAACLPGEEGTAERIERL EVSSLAQTSSAVASSTDGSIHTDSVDGTPDPQRTKAAIAHLQQ KILKLTEQIKIAQTARRNRRPGS*KDCTP*KCLRKSDEALNRV LQQI\RVPPKMKRGTSLHSRRGKPEAPKGSPQINRKSGQEMTA VMQSGRPRSSSTTDAPTGSAMMEIACAAAAAAAACLPGEEGTA ERIERLEVSSLAQTSSAVASSTDGSIHTDSVDGTPDPQRTKAA IAHLQQKILKLTEQIKIAQTARRNRRPG
62	801	232	1299	MQTIERLVKERDDLMSALVSVRSSLADTQQREASAYEQVKQVL QISEEANFEKTKALIQCDQLRKELERQAERLEKELASQQEKRA IEKDMMKKEITKEREYMGSKMLILSQNIAQLEAQVEKVTKEKI SAINQLEEIQSQLASREMDVTKVCGEMRYQLNKTNMEKDEAEK EHREFRAKTNRDLEIKDQEIEKLRIELDESKQHLEQEQQKAAL AREECLRLTELLGESEHQLHLTRQEKDSIQQSFSKEAKAQALQ AQQREQELTQKIQQMEAQHDKTENEQYLLLTSQNTFLTKLKEE CCTLAKKLEQISQKTRSEIAQLSQEKRYTYDKLGKLQRRNEEL EEQCVQHGRST*
63	802	3	334	SYPVWWNSPLTAEVPPELLAAAGFFHTGHQDKVRCFFCYGGLQ SWKRGDDPWTEHAKWFPSCQFLLRSKGRDFVHSVQETHSQLLG SWDPWEEPEDAAPVAPSVPASGYPELPTPRREVQSESAQEPGG VSPAEAQRAWWVLEPPGARDVEAQLRRLQEERTCKVCLDRAVS IVFVPCGHLVC\AECAPGLQLCPI\CRSPCGPLRPCLWVP
64	803	70	456	MCSYREKKAEPQELLQLDGYTVDYTDPQPGLEGGRAFFNAVKE GDTVIFASDDEQDRILWVQAMYRATGQSHKPVPPTQVQKLNAK GGNVPQLDAPISQFYADRAQKHGMDEFISSNPCNFDHASLFEM *
65	804	2	1376	KQLIVLGNKVDLLPQDAPGYRQRLRERLWEDCARAGLLLAPGH QGPQRPVKDEPQDGENPNPPNWSRTVVRDVRLISAKTGYGVEE LISALQRSWRYRGDVYLVGATNAGKSTLFNTLLESDYCTAKGS EAIDRATISPWPGTTLNLLKFPICNPTPYRMFKRHQRLKKDST QAEEDLSEQEQNQLNVLKKHGYVVGRVGRTFLYSEEQKDNIPF EFDADSLAFDMENDPVMGTHKSTKQVELTAQDVKDAHWFYDTP GITKENCILNLLTEKEVNIVLPTQSIVPRTFVLKPGMVLFLGA IGRIDFLQGNQSAWFTVVASNILPVHITSLDRADALYQKHAGH TLLQIPMGGKERMAGFPPLVAEDIMLKEGLGASEAVADIKFSS AGWVSVTPNFKDRLHLRGYTPEGTVLTVRPPLLPYIVNIKGQR IKKSVAYKTKKPPSLMYNVRKKKGKINV
66	805	1	874	STVASMMHRQETVECLRKFNARRKLKGAILTTMLVSRNFSAAK SLLNKKSDGGVKPQSNNKNSLVSPAQEPAPLQTAMEPQTTVVH NATDGIKGSTESCNTTTEDEDLKAAPLRTGNGSSVPEGRSSRD RTAPSAGMQPQPSLCSSAMRKQEIIKITEQLIEAINNGDFEAY TKICDPGLTSFEPEALGNLVEGMDFHKFYFENLLSKNSKPIHT TILNPHVHVIGEDAACIAYIRLTQYIDGQGRPSNPAKSEE\TR VWH\RR\DGKWLNVYHCSGAPCPHRCSELSHRGF

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67	806	3	1714	LPKNVVFVLDSSASMVGTKLRQTKDALFTILHDLRPQDRFSII GFSNRIKVWKDHLISVTPDSIRDGKVYIHHMSPTGGTDINGAL QRAIRLLNKYVAHSGIGDRRVSLIVFLTDGKPTVGETHTLKIL NNTREAARGQVCIFTIGIGNDVDFRLLEKLSLENCGLTRRVHE EEDAGSQLIGFYDEIRTPLLSDIRIDYPPSSVVQATKTLFPNY FNGSEIIIAGKLVDRKLDHLHVEVTASNSKKFIILKTDVPVRP QKAGKDVTGSPRPGGDGEGDTNHIERLWSYLTTKELLSSWLQS DDEPEKERLRQRAQALAVSYRFLTPFTSMKLRGPVPRMDGLEE AHGMSAAMGPEPVVQSVRGAGTQPGPLLKKPYQPRIKISKTSV DGDPHFVVDFPLSRLTVCFNIDGQPGDILRLVSDHRDSGVTVN GELIGAPAPPNGHKKQRTYLRTITILINKPERSYLEITPSRVI LDGGDRLVLPCNQSVVVGSWGLEVSVSANANVTVTIQGSIAFV ILIHLYKKPAPFQRHHLGFYIANSEGLSSNCRVFCESGILIQE LTQQSVAVAGR
68	807	2	841	FFLEQVSQYTFAMCSYREKKSEPQELMQLEGYTVDYTDPHPGL QGGCMFFNAVKEGDTVIFASDDEQDRILWVQAMYRATGQSYKP VPAIQTQKLNPKGGTLHADAQLYADRFQKHGMDEFISANPCKL DHAFLFRILQRQTLDHRLNDSYSCLGWFSPGQVFVLDEYCARY GVRGCHRHLCYLAELMEHSENGAVIDPTLLHYSFAFCAS\HVH GNRPDGIGTVSVEEKERFEEIKERLSSLLENQISHFRYCFPFG RPEGALKATLSLLERVLMKDIA
69	808	2	757	DGLLHEVLNGLLDRPDWEEAVKMPVGILPCGSGNALAGAVNQH GGFEPALGLDLLLNCSLLLCRGGGHPLDLLSVTLASGSRCFSF LSVAWGFVSDVDIQSERFRALGSARFTLGTVLGLATLHTYRGR LSYLPATVEPASPTPAHSLPRAKSELTLTPDPAPPMAHSPLHR SVSDLPLPLPQPALASPGSPEPLPILSLNGGGPELAGDWGGAG DAPLSPDPQLSSPPGSPKAALHSPV*KKAPVIPPDM
70	809	3	530	KGVPTLLMAAGSFYDILAITGFNTCLGIAFSTGSTVFNVLRGV LEVVIGVATGSVLGFFIQYFPSRDQDKLVCKRTFLVLGLSVLA VFSSVHFGFPGSGGLCTLVMAFLAGMGWTSEKAEVEKIIAVAW DIFQPLLFGLIG\AEVSI\SSLRPETVGLCVATVGI\AVLIRI FDYIF
71	810	228	541	LLKEVVVQASPVCKTCCSQLVRTPVTFTEVQNV/CRCSAGYLI SVCSYTSSDHNQCYAGTASLALLWIGGILKGCLLWKQFRWTER SHWNFGYWALWSPGNGNGC
72	811	173	404	ICTSTYLQIFPGKPSCFMCKGRLMCIYFILWYLGHYTSLHWNW CRYISDPNVD/ACPDPRNAEVSMTHTVPALMELID
73	812	2	586	LESLPGFKEIVSRGVKVDYLTPDFPSLSYPNYYTLMTGRHCEV HQMIGNYMWDPTTNKSFDIGVNKDSLMPLWWNGSEPLWVTLTK AKRKVYMYYWPGCEVEILGVRPTYCLEYKNVPTDINFANAVSD ALDSFKSGRADLAAIYHERIDVEGHHYGPASPQRKDALKA\VD TVLKYMTKWIQERGLQDRLNVII

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74	813	2	348	ARDFHPKQTLDFLRSDMANSKITEEVKRSIAQQYLDLTVA/LE QVDPDAEVDAAPSTTSSCGH*DSHAGS*RVLSLLGD*GPA*TG ANSMAGKLLLVAWLGFPDPFWGKELSDPAFK
75	814	2	366	KQSGDVTCNCTDGRLAPSCLTCVGHCIFGGYCTMNSKMMPECQ SPPHMTGPRCEEHVFSQHQPGHITSILIPML*LLLLVLVAGVI FCHKRRVQGAKGFQHQRMTNGAMNAQIANPTYKMY
76	815	420	681	TVENAGRWL*EEAEIQAELERLERVRNLHIRELKRINNEDNSQ FKDHPTLNERYLLLHLLGRGGFSEVYKVMYGLFWFFYTNVARI
77	816	37	428	MCEEFLVMGKGCSCVF*ILLSNPQMWWLNDSNPETDNRQESPS QENIDRVSD/MAFVPSAWTASGGVAWGNLGESGSRTGGVRAET LAPRLQV*PAHLRGHPRSNRGQGRPPWKAGKLGKCQEVLFRFA AF
78	817	1	358	FRAMFLAVQHDCRPMDKSAGSGHKSEEKREKMKRTLLKDWKTR LSYFLQNSSTPGKPKTGKKSKQQAFIK*VENPELANINS*LLN *KGEL**A*ANIQNLSCRPSPEEAQLWSEAFDE
79	818	1	169	GFFNFSSPKLKGWKINSSLVLEIRKNILRFLDAERDVSVVKSS FPSKDARHSSVHR*FTQLHWGPPSHTPARP*RGFFNFSSPKLK GWKINSSLVLEIRKNILRFLDAERDVSVVKSSFPSKDARHSSV HR
80	819	55	310	RIDDQQELKRVT*YSQKEYTKKKLHKKCNIIQADIKPDNILDN ESITILKLSDFGSASHVADNDITPSSSQTTSAASSPPRTLRR
81	820	1	134	SSKPWD*SLAPKHSG*TKNMDCYCIIPTCIGRERCYGTCIGDT V
82	821	187	360	NSSKKLVMEHQWKKYLRRNYQRMLNRLITLIGSCGVL*LISTI PTSRLKFLKETGHGTPMEEIPEEELSEDVEQIDHADRELRRGQ NLRCKGIHRLPTHIQVGQN
83	822	208	723	KWMLLHSFKIFCLSLYPQL*CPFEFFSHSATIFHELVYKQTKI ISSNQELIYEGRRLVLEPGRLAQHFPKTTEENPIFVVSREPLN TIGLIYEKISLPKVHPRYDLDGDASMAKAITGVVCYACRIAST LLLYQELMRKGIRWLIELIKDDYNETVHKKTEVVITLGFLVSR
84	823	1	314	GTRKMGPTVSPICLPGTWGDYNLMDGDLGLISGWGRTEKRDRA DRLKAGRSPAAG*RKWEPGRGDPTWEESEEDVHKSKWTRCVDE KGA*C*TDNKRPLRCGVT
85	824	3	302	HELENLIKSAHSYSLY*G*YLHGA*TAEPEASFCPRRGWNRQA GAAGSRMNFRPGVLSSRQLGLPGPPDGPDYTVYYPFHRLAMVT AASRLEREHLTHL
86	825	87	422	PVPLPHPILEVCPGQ*EPQSAISLTAFQVQAGASRASPGPPAP SSSKPGRKAKVASPCPDRPAPPPT*PRPAAAPGSESSPRPPRP RTGRRQQRAHARRAAARTAPWRPSC
87	826	3	289	HEGRRRGWASASQRFLRNWAFLTPSKVRRLKGQKAFGKLPSHS DTSLTSDLGFHHRFNPNASSSFKPSGTKFAIQYGTGRVDGILS EDKLTVSGL
88	827	1	101	GRNIMHYPNGHAICIANGHCIIL*NSHNIKVWV

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89	828	1	535	INLGNTCYMNSVI*ALFMATDFRRQVLSLNLNGCNSLMKKLQH LFAFLAHTQREAYAPRIFFEASRPPWFTPRSQQDCSEYLRFLL DRLHEEEKILKVQASHKPSEILECSETSLQEVASKAAVLTETP RTSDGEKTLIEKMFGGKLRTHIRCLNCTSTSQKVEAFTDLSLA FWPSSS
90	829	1	434	ARDDPRVRLSLSPNFF*LASKLGKQWTPLIILANSLSGTNMGE
91	830	3	782	MHRIKLNDRMTFPEELDMSTFIDVEDEKSPQTESCTDSGAENE GSCHSDQMSNDFSNDDGVDEGICLETNSGTEKISKSGLEKNSL IYELFSVMVHSGSAAGGHYYACIKSFSDEQWYSFNDQHVSRIT QEDIKKTHGGSSGSRGYYSSAFASSTNAYMLIYRLKDPARNAK FLEVDEYPEHIKNLVQKERELEEQEKRQREIERNTCKIKLFCL HPTKQVMMED*IEVHKDKTLKEAVEMAYKMMDLEEVIPLDCCR L
92	831	2	604	SVMPVPALCLLWALAMVTRPASAAPMGGPELAQHEELTLLFHG TLQLGQALNGVYRTTEGRLTKARNSLGLYGRTIELLGQEVSRG RDAAQELRASLLETQMEEDILQLQAEATAEVLGEVAQAQKVLR DSVQRLEVQLRSAWLGPAYREFEVLKAHADKQSHILWALTGHV QRQRREMVAQQHRLRQIQERLHTAALPA
93	832	16	690	ITSVDPRVRGNASTGYGKIWLDDVSCDGDESDLWSCRNSGWGN NDCSHSEDVGVICSDASDMELRLVGGSSRCAGKVEVNVQGAVG ILCANGWGMNIAEVVCRQLECGSAIRVSREPHFTERTLHILMS NSGCAGGEASLWDCIRWEWKQTACHLNMEASLICSAHRQPRLV GADMPCSGRVEVKHAHTWRSVCDSDFSLHAANVLCRELNCGDA ISLSVGDHFG
94	833	108	727	SNYPSSRFRVAGITGVKLGMRSIPIATACTIYHKFFCETNLDA YDPYLIAMSSIYLAGKVEEQHLRTRDIINVSNRYFNPSGEPLE LDSRFWELRDSIVQCELLMLRVLRFQVSFQHPHKYLLHYLVSL QNWLNRHSWQRTPVAVTAWALLRDSYHGALCLRFQAQHIAVAV LYLALQVYGVEVPAEVEA/DEAVGWQIYAMDTEIP
95	834	118	376	RGSRHAVHGWAFGLLFINKESVVMAYLFTTFNAFQGVFIFVFH CALQKKVRSRRGPGSQPPLETFPGYPGEGGEGGGDSGAPSSPQ
96	835	3	333	ARKDDLPPNMRFHEEKRLDFEWTLKAG*EKG*PSK*NKGWBGQ E***TVRD*GIS**VKPQHLS*\ALQMALKRVYTLLSSWNCLE DFDQIFWGQKSALAGQWFPEVSIIP
97	836	740	951	GKQQRETLRRPSPTISVQRAGSPEHSSASH*HSPCPAPGQRVL PTALCTLMTSKHFHGCPLAGQGRAVTL

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98	837	81	1503	GVCGLPRFCGSIILCHYEMSSLGASFVQIKFDDLQFFENCGGG SFGSVYRAKWISQDKEVAVKKLLKIEKEARILSVLSHRNIIQF YGVILEPPNYGIVTEYASLGSLYDYINSNRSEEMDMDHIMTWA TDVAKGMHYLHMEAPVKVIHRDLKSRNVVIAADGVLKICDFGA SRFHNHTTHMSLVGTFPWMAPEVIQSLPVSETCDTYSYGVVLW EMLTREVPFKGLEGLQVAWLVVEKNERLTIPSSCPRSFAELLH QCWEADAKKRPSFKQIISILESMSNDTSLPDKCNSFLHNKAEW RCEIEATLERLKKLERDLSFKEQELKERERRLKMWEQKLTEQS NTPLLLPLAARMSEESYFESKTEESNSAEMSCQITATSNGEGH GMNPSLQAMMLMGFGDIFSMNKAGAVMHSGMQINMQAKQNSSK TTSKRRGKKVNMALGFSDFDLSEGDDDDDDDGEEEYNDMDNSE
99	838	185	328	MLWETGCSAACRVTVSPTVTFATFSTRGIDAMRPGPSFLWRQQ LSQG*
100	839	1	348	PTLGDQPDLHSITRASRPKLCTRKNCNPLTITVHDPNSTQ*YY GMSWELRFYIPGFDVGTMFTIQKILVSWSPPKPIGPLTDLGDP MFQKPPNKVDLTVPPPFLVIKDTLQKFEKI
101	840	1	416	SLNNVTLPQAKTEKDFIQLCTPGVIKQEKLGTVYCQASSPGAN MIGNKMSAISVHGVSTSGGQMYHYDMNTASLSQQ*DQKPIFNV IPPIPVGSENWNRCQGSGDDNLTSLGTLNFPGRTVSFSFEMES RSVAQAGVQ
102	841	105	354	RHTQECRCPHTHIHTHTHSHTHSHTHSHSHSHTTPRCSHTQPP HAQAPALC*S*EDRGQPTWKLCAHRPRLKVIKEGGWLGG
103	842	171	347	NYSLSVYLVRQLTAGTLLQKLRAKGIRNPDHSRALSE*HLSSL PHLIWIQVFLALQPS
104	843	2	690	ATYIVDFGFSTTFREGQMLTAFCGMYPYVAPERSLGQACQ*PA RDIQSLSVILYFRNTVGRRARTLPFYS/AEASKLQEKILTGRY HAPPLLALQLDSL/IKLLMLNARKCPSL*LMKNPWVKSSQKMP LIPYEEPL/RGPPQTIQLMVAMGFQAKNISVAIIERKFNYPMA TYLILEHTKQERKCSTIRELSLPPGVPTSPSPSTELSTFPLSL MRAHREPAFNVQPPEESQ
105	844	2	777	AKQELAKLMRIEDPSLLNSRVLLHHAKAGTIIARQGDQDVSLH FVLWGCLHVYQRMIDKAEDVCLFVAQPGELVGQLAVLTGEPLI FTLRAQRDCTFLRISKSDFYEIMRAQPSVVLSAAHTVAARMSP FVRQMDFAIDWTAVEAGRALYRCSSHRAAQARPRGGDLGVVRP C*PPRPLRQGDRSDCTYIVLNGRLRSVIQRGSGKKELVGEYGR GDLIGVVSATPTH*PLAFSRPVPRQLTRIIPGNPGSGEVFPGA
106	845	3	709	HASGWTPGTTQTLGQGTAWDTVASTPGTSETTASAEGRRTPGA TRPAAPGTGSWAEGSVKAPAPIPESPPSKSRSMSNTTEGVWEG TRSSVTNRARASKDRREMTTTKADRPREDIEGVRIALDAAKKV LGTIGPPALVSETLAWEILPQATPVSKQQSQGSIGETTPAAGM WTLGTPAADVWILGTPAADVWTSMEAASGEGSAAGDLDAATGD RGPQATLSQTPAV*PWGPPG

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107	846	3	406	AGTSGTGDTGPGNTAVSGTPVVSPGATPGAPGSSTPGEADIGN TSFGKSGTPTVSAASTTSSPVSKHTDAASATAVTISGSKPGTP GTPGGATSGGKITPGIA*PTLDQKSPCFSGYGGYFPVNPHQNP CADSL
108	847	1	565	RAHRCCLPLPSLSCEIQIGFS*SSIFPGQ*ACPCSCCRSCRRN WPQSPRCPHHPPAPCSLLLSSCLPPPLSCSWRGTSGKPPSQSP AASRSMRPRCSPRTSSLRGASCRGPGGSAPAAASGPRCRGCSR SPRRCSRSGCAAASPPRSQRRSPPLSPPPFPTSGTLLLKTSRF GSATRE*SSPRPRPRP
109	848	2	987	DDVPPPAPDLYDVPPGLRRPGPGTLYDVPRERVLPPEVADGGV VDSGVYAVPPPAEREAPAEGKRLSASSTGSTRSSQSASSLEVA GPGREPLELEVAVEALARLQQGVSATVAHLLDLAGSAGATGSW RSPSEPQEPLVQDLQAAVAAVQSAVHELLEFARSAVGNAAHTS DRALHAKLSRQLQKMEDVHQTLVAHGQALDAGRGGSGATLEDL DRLVACSRAVPEDAKQLASFLHGNASLLFRRTKATAPGPEGGG TLHPNPTDKTSSIQSRPLPSPPKFTSQDSPDGQYENSEGGWME DYDYVHLTGGRRSF*KTQKELLGKRAA
110	849	84	372	MATDEENVYGLEENAQSRQESTRRLILVGRTGAGKSATGNSIL GQRRFFSRLGATSVTRACTTGSRRWDKCHVEVVDTPDIFSSQV SKTDPGCEERX*
111	850	2	47	TLGLRSLTKEGGGGGDVAAFEVGTGAAASRALGQCGQLQKLIV IFIGSLCGLCTKCAVSNDLTQQEIQTPEIQQRNA*CDSRVTFT NEGGRWWG
112	851	1192	1040	FFFLVETRFHHIGQAGLELLTLSIK*SARLGLPKCWDDRREPP YLAGFMI
113	852	791	362	RRSPPPAPPPLPSPLSPPPRAPVSPASTMPILLFLIDTSASMN QRSHLGTTYLDTAKGAVETFMKLRARDPASRGDRYMLVTFEEP PYAIKAGWKENHATFMNELKNLQAEGLTTLGQSLRTAFDLLNL NRLVTGIDNYGQVG
114	853	812	348	NCRTYVFCFVLVFRLLFLHGSPLSPSLLSRAGLLCGSAENPTP FLCGITMAAGVSLLALVVRVILSTAILCPSGASRRQRSSEVEW GTDSGVYRLYCWRVGFLGPGGELRLGLSEARGGRVWGRGEKRC RVWAVRSLRKGFGSVAALRRGIWAG
115	854	93	170	VTPTPPQYYTCSCVLGFIACSIFLQMSLKPKVMLLTVALVACL VLFNLSQCWQRDCCSQGLGNLTEPSGTNR*GPAAVSWASLPAP SSCR
116	855	1	183	GKAGGAAGLFAKQVQKKFSRAQEK*TRRFGKTCQPEERAREER QEGPEIEFGFSFFSLSLY

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
117	856	53	2400	PKRLFLFQDVNTLQGGGQPVVTPSVQPSLQPAHPALPQMTSQA PQPSVTGLQAPSAALMQVSSLDSHSAVSGNAQSFQPYAGMQAY AYPQASAVTSQLQPVRPLYPAPLSQPPHFQGSGDMASFLMTEA RQHNTEIRMAVSKVADKMDHLMTKVEELQKHSAGNSMLIPSMS VTMETSMIMSNIQRIIQENERLKQEILEKSNRIEEQNDKISEL IERNQRYVEQSNLMMEKRNNSLQTATENTQARVLHAEQEKAKV TEELAAATAQVSHLQLKMTAHQKKETELQMQLTESLKETDLLR GQLTKVQAKLSELQETSEQAQSKFKSEKQNRKQLELKVTSLEE ELTDLRVEKESLEKNLSERKKKSAQERSQAEEEIDEIRKSYQE ELDKLRQLLKKTRVSTDQAAAEQLSLVQAELQTQWEAKCEHLL ASAKDEHLQQYQEVCAQRDAYQQKLVQLQEKSVCFA\CLALQA QITALTKQNEQHIKELEKNKSQMSGVEAAASDPSEKVKKIMNQ VFQSLRREFELEESYNGRTILGTIMNTIKMVTLQLLNQQEQEK EESSSEEEEEKAEERPRRPSQEQSASASSGQPQAPLNRERPES PMVPSEQVVEEAVPLPPQALTTSQDGHRRKGDSEAEALSEIKD GSLPPELSCIPSHRVLGPPTSIPPEPLGPVSMDSECEESLAAS PMAAK\PDNPSGK\VCVQGK*APDGPTYKE\SSTRLFPGFQDP E\EGDPLALGLE\SPG\EPQPPQLQGKVDVH*VPPVPHKGAFQ EQEGRFPQFCRE
118	857	1	791	SETAQQIIDRLRVKLAKEPGANLFLMAVQDIRVGGRQSNASYQ YTLLSDDLAALREWEPKIRKKLATLPELADVNSDQQDNGAEMN LVYDRDTMARLGIDVQAANSLLNNAFGQRQISTIYQPMNQYKV VMEVDPRYTQDISALEKMFVINNEGKAIPLSYFAKWQPANAPL SVNHQGLSAALTISFNLPTGKSLSDASAAIDRAMSQLGVPSTV RGSFAGPAQVFQETMNSQVILIIAAIATVYIVLGIPYERYVHP PTILL*RPGANLFLMAVQDIRVGGRQSNASYQYTLLSDDLAAL REWEPKIRKKLATLPELADVNSDQQDNGAEMNLVYDRDTMARL GIDVQAANSLLNNAFGQRQISTIYQPMNQYKVVMEVDPRYTQD ISALEKMFVINNEGKAIPLSYFAKWQPANAPLSVNHQGLSAAL TISFNLPTGKSLSDASAAIDRAMSQLGVPSTVRGSFAGPAQVF QETMNSQVILIIAAIATVYIVLGIPYERYVHPPTILL
119	858	3	417	IITPDAMGCQKDIAEKIQKQGGDYLFAVKGNQGRLNKAFEEKF PLKELNNPEHDSYAISEKSHGREEIRLHIVCDVPDELIDFTFE WKGLKKLCVAVSFRSIIAEQKKEPEMTVRYNIS*LGIAGDISV TAISGTDD
120	859	2	373	HYLKMLTQARREVIIANAYFFPGYRFLHALRKAARRGVRIKLI IQGEPDMPIVRVGARLLYNYLVKGGVQVFEYRRRPLHGKVALM DDHWATVGSSNLHPVS*SGNLQANVILHVLRVPTLNP
121	860	286	495	CWSKSAAFHSKLATTCIVPVCAAGHCSAAW*SLRPIEALAKEV RELK*HTR*LLNPATTRELTSLGRNLNRLLKSERERYDKYRTT LTDLTHSLKTPLAVLQSTLRSLRSEKMSVSDAEPVMLEQISRI SQQIGYYLHRASMRGGTLLSRELHPVAPLLDNLTSALIKGKPR KGGNVTVFPFTAMYRDGH

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122	861	2	725	GNTVMFQHLMQKRKHTQWTYGPLTSTLYDLTEIDSSGDEQSLL ELIITTKKREARQILDQTPVKELVSLKWKRYGRPYFCMLGAIY LLYIICFTMCCIYRPLKPRTNNRTSPRDNTLLQQKLLQEAYMT PKDDIRLVGELVTVIGAIIILLVEVPDIFRMGVTRFFGQTILG GPFHVLIITYAFMVLVTMVMRLISASGEVVPMSFALVLGWCNV MYFARGFQMLGPFTIMIQKMIFGDLM
123	862	1	135	EKAAAANIDEVQKSDVSSTGQGVIDKDALGPMMLEVAHLHFSA VF
124	863	2	364	LEVPSEVTPLGFAMQATKTLLLRTCCLQEFNIMEKNKGWALLG GKDGHLQGLFLLANALLERNQLLAQKVMYLLVPLLNRGNDKHK LTSAGFFVELLRSPVAKRLPSIYSVARFKDWLQD
125	864	1	374	RPAPAPSAAPEEAPSP\GVKGRGMAKRRVPAPVWGGAGGGTKS ARRAAAAPDTERSEEGGRAVKEAYPSSRQPPPPSP*PLRCARR CHPNLAPSMPISNREGKGKRREEKIRPLSPASTHTSARA
126	865	3	364	LQGVHGSSSTFCSSLSSDFDPLEYCSPKGDPQRVDMQPSVTSR PRSLDSEVPTGETQVSSHVHYHRHRHHHYKKRFQRHGRKPGPE TGVPQSRPPIPRTQPQPEPPSPDQQVTRSNSAAP
127	866	2	250	MADPDPRYPRSSIEDDFNYGSSEASDTVHIRMAFLRRVYSILS LQDLLATVTSTDNLAFEDGRTDWLQRPDCVSFKIHVLPM
128	867	194	375	AGMSVVVVPPIGSSYLGLISQEHFPNEFTSGDGKKAHQDFGYF YGSSYVAASDSSRTPGL
129	868	104	339	VAAALTLFPQQLSPPGAWGLGLSACFCCAEGFSRLNQQVLSSS LLLLSRTNCPCKYSFLDNLKKLTPRRDVPTYPKVR
130	869	2	360	RDDACLYSPASAPEVITVGATNAQDQPVTLGTLGTNFGRCVDL FAPGEDIIGASSDCSTCFVSQSGTSQAAAHVAGIAAMMLSAEP ELTLAELRQRLIHFSAKDVINEAWFPEDQRVLT
131	870	2	105	LEIKFLEQVDQFYDDNFPMEIRHLLAQWIENQDW
132	871	2	466	EAGDADEDEADANSSDCEPEGPVEAEEPPQEDSSSQSDSVEDR SEDEEDEHSEEEETSGSSASEESESEESEDAQSQSQADEEEED DDFGVEYLLARDEEQSEADAGSGPPTPGPTTLGPKKEITDIAA AAESLQPKGYTLATTQVKTPIPLLL
133	872	1	354	LKNLRELLLEDNQLPQIPSGLPESLTELSLIQTNIYNITKEGI SRLINLKNLYLAWNCYFNKVCEKTNIEDGVFETLTNLELLSLS FNSLSHVPPKLPSSLRKLFLSNTQIKYISEED
134	873	59	184	MRSQALGQSAPSLTASLKELSLPRRGSFPVCPNAGRTSPLG*
135	874	1	210	LLCVCLPVGACPSLSLLTAPLNQLMRCLRKYQSRTPSPLLHSV PSEIVFDFEPGPVFRGSWALLSWSTRP
136	875	131	254	QTPDKKQNDQRNRKRKAEPYETSQGSNNFVSTKVLNSNVLR
137	876	84	504	YFIIKGMVELVPASDTLRKIQVEYGVTGSFKDKPLAEWLRKYN PSEEEYEKASENFIYSCAGCCVATYVLGICDRHNDNIMLRSTG HMFHIDFGKFLGHAQMFGSFKRDRAPFVLTSDMAYVINGGEKP TIRFQLFVDL

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138	877	3	215	PSPLPSLSLPPPVAPGGQESPSPHTAEVESEASPPPARPLPGE ARLAPISEEGKPQLVGRF\QVTSSK\NRLSLFPCSQHPPLSLV LQNLQPLSSLQRAQIQRTV/PGGGPETREALAESDRAAEGLGA GVEEEGDDGKEPQVGGSPQPLSHPSPVWMNYSYSSLCLSSEES ESSGEDEEFWAELQSLRQKHLSEVETLQTLQKKEIEDLYSRLG KQPPPGIVAPAAMLSSRQRRLSKGSFPTSRRNSLQRSEPPGPG ETA/GHPASIFSLRPLSVDCFSPGPGGLPRGNRPPLPTSPFLT *CSPSPHTAEVESEASPPPARPLPGEARLAPISEEGKPQLVGR FPSDFIQGTG
139	878	1	337	RRFVSQETGNLYIAKVEKSDVGNYTCVVTNTVTNHKVLGPPTP LILRNDGVMGEYEPKIEVQFPETVPTAKGATVKLECFALGNPV PTIIWRRADGKPIARKARRHKSRVGK
140	879	72	917	MLRTCYVLCSQAGPRSRGWQSLSFDGGAFHLKGTGELTRALLV LRLCAWPPLVTHGLLLQAWSRRLLGSRLSGAFLRASVYGQFVA GETAEEVKGCVQQLRTLSLRPLLAVPTEEEPDSAAKSGEAWYE GNLGAMLRCVDLSRGLLEPPSLAEASLMQLKVTALTSTRLCKE LASWVRRPGASLELSPERLAEAMDSGQNLQVSCLNAEQNQHLR ASLSRLHRVAQYARAQHVRLLVDAEYTSLNPALSLLVAALAVR WNSPGEGGPWVWNTYQACLKDTF*
141	880	219	308	PHHRIAGDTAIDKNIHQSVSEQIKKNFAK
142	881	182	317	QMTNPFFLCFTTMISNCNFFKGPPGPPGEKGDRGPTGESGPRG FP
143	882	177	341	NGIIASFFLRTFIFCFIHIQGCQAGQTIKVQVSFDLLSLMFTF VSPCTNDLIIH
144	883	3	1441	KLSVNHRRTHLTKLMHTVEQATLRISQSFQKTTEFDTNSTDIA LKVFFFDSYNMKHIHPHMNMDGDYINIFPKRKAAYDSNGNVAV AFLYYKSIGPLLSSSDNFLLKPQNYDNSEEEERVISSVISVSM SSNPPTLYELEKITFTLSHRKVTDRYRSLCAFWNYSPDTMNGS WSSEGCELTYSNETHTSCRCNHLTHFAILMSSGPSIGIKDYNI LTRITQLGIIISLICLAICIFTFWFFSEIQSTRTTIHKNLCCS LFLAELVFLVGINTNTNKLFCSIIAGLLHYFFLAAFAWMCIEG IHLYLIVVGVIYNKGFLHKNFYIFGYLSPAVVVGFSAALGYRY YGTTKVCWLSTENNFIWSFIGPACLIILVNLLAFGVIIYKVFR HTAGLKPEVSCFENIRSCARGALALLFLLGTTWIFGVLHVVHA SVVTAYLFTVSNAFQGMFIFLFLCVLSRKIQEEYYRLFKNVPC CFGCLR
145	884	1	429	GTREAAPSRFMFLLFLLTCELAAEVAAEVEKSSDGPGAAQEPT WLTDVPAAMEFIAATEVAVIGFFQDLEIPAVPILHSMVQKFPG VSFGISTDSEVLTHYNITGNTICLFRLVDNEQLNLEDEDIESI DATKLSRFIEINSL
146	885	1	156	DETSGLIVREVSIEISRQQVEELFGPEDYWCQCVAWSSAGTTK SRKAYVRIA
147	886	1	121	GTRSIHVKLDVGKLHTQPKLAAQLRMVDDGSGKVEGLPGI

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148	887	128	652	XCGEDGSFTQVQCHTYTGYCWCVTPDGKPISGSSVQNKTPVCS GSVTDKPLSQGNSGRKDDGSKPTPTMETQPVFDGDEITAPTLW IKHLVIKDSKLNNTNIRNSEKVYSCDQERQSALEEAQQNPREG IVIPECAPGGLYKPVQCHQSTGYCWCVLVDTGRPLPGTSTRYV MPSX*
149	888	128	273	VLQLIKSQKFLNKLVILVETEKEKILRKEYVFADSKVSDSKLL KWAVR
150	889	1	948	RRLSLLDLQLGPLGRDPPQECSTFSPTDSGEEPGQLSPGVQFQ RRQNQRRFSMEDVSKRLSLPMDIRLPQEFLQKLQMESPDLPKP LSRMSRRASLSDIGFGKLETYVKLDKLGEGTYATVFKGRSKLT ENLVALKEIRLEHEEGAPCTAIREVSLLKNLKHANIVTLHDLI HTDRSLTLVFEYLDSDLKQYLDHCGNLMSMHNVKVRPRGQGPP ILAATCPEAQCGDPLSPPGIRLLRWLKPSHVGKRERAMPSTSP GTGLSALPQEQTHTVCHCLAVGIKPTLNSEHQFPSLSNGSVSY LPKCREASGEARGYE
151	890	3	108	HERHEPSPTALAFGDHPIVQPKQLSFKIIQVNDN
152	891	2	208	ARGPSLLSEFHPGSDRPQERRTSYEPIHPGPSPVDHDSLESKR PRLEQASDSHYQGHITGESLPGRVH
153	892	1	116	GTRKEEFSAEENFLILTEMATNHVQVLVEFTKKLPGIF
154	893	74	661	HTHKLVAPRPGLPPTSQWPRDAGRQASGGLPSLSTGPPKGPRD GLARGHPAEWLAGSPGNNSPTQGSLPPQLDLYAGALFVHICLG WNFYLSTILTLGITALYTIAGMVPAAGRSTQGTCKGVRRPPPP TGPREQPRKWPQQEPQKFLPVSLLPGARAPSSNLASTGRGPGC CNLHGRPADAHHGGGGCHPDNQR
155	894	55	312	MVNHSLQETSEQNVILQHTLQQQQQMLQQETIRNGELEDTQTK LEKQVSKLEQELQKQRESSAEKLRKMEEKCESAAHEADLKRQK *
156	895	38	185	VCPKWCRFLTMLGHCCYFWHVWPAS*ALSAGPTPTSRSFSPSP LRSIST
157	896	37	462	MRGPPVLLLQAAPMECPVPQGIPAGSSPEPAPDPPGPHFLRQE RSFECRMCGKAFKRSSTLSTHLLIHSDTRPYPCQFCGKRFHQK SDMKKHTYIHTGEKPHKCQTQREPTMVLSPADKTNVKAAWX*
158	897	3	175	HEQLTNNTATAPSATPVFGQVAASTAPSLFGQQTGITASTAVA TPQVISSRFINLDF
159	898	187	677	VSVFKNCPMY*ICIFLTKMFCVLII*NKF*VHKKPLQEVEIA AITHGALQGLAYLHSHTMIHRDIKAGNILLTEPGQVKLADFGS ASMASPANSFVGTPYWMAPEVILAMDEGQYDGKVDVWSLGITC IELAERKPPLFNMNAMSALYHIAQNESPTLQSNEW

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
160	899	2	1060	RHARPGGGGHSNQRKMSLEQEEETQPGRLLGRRDAVPAFIEPN VRFWITERQSFIRRFLQWTELLDPTNVFISVESIENSRQLLCT NEDVSSPASADQRIQEAWKRSLATVHPDSSNLIPKLFRPAAFL PFMAPTVFLSMTPLKGIKSVILPQVFLCAYMAAFNSINGNRSY TCKPLERSLLMAGAVASSTFLGVIPQFVQMKYGLTGPWIKRLL PVIFLVQASGMNVYMSRSLESIKGIAVMDKEGNVLGHSRIAGT KAVRETLASRIVLFGTSALIPEVFTYFFKRTQYFRKNPGSLWI LKLSCTVLAMGLMVPFSFSIFPQIGQIQYCSLEEKIQSPTEET EIFYHRGV
161	900	3	564	HASGRLEVFYNGTWGSVGRRNITTAIAGIVCRQLGCGENGVVS LAPLSKTGSGFMWVDDIQCPKTHISIWQCLSAPWERRISSPAE ETWITCEDRIRVRGGDTECSGRVEIWHAGSWGTVCDDSWDLAE AEVVCQQLGCGSALAALRDASFGQGTGTIWLDDMRCKGNESFL WDCHAKPWGQSDCG
162	901	1099	2	LGDFPQPQRQRRPGASDLPPHLAGARQWEVRFFRHLPARTLPP SLRMPEGPELHLASQFVNEACRALVFGGCVEKSSVSRNPEVPF ESSAYRISASARGKELRLILSPLPGAQPQQEPLALVFRFGMSG SFQLVPREELPRHAHLRFYTAPPGPRLALCFVDIRRFGRWDLG GKWQPGRGPCVLQEYQQFRENVLRNLADKAFDRPICEALLDQR FFNGIGNYLRAEILYRLKIPPFEKARSVLEALQQHRPSPELTL SQKIRTKLQNPDLLELCHSVPKEVVQLGGRGYGSESGEEDFAA FRAWLRCYGMPGMSSLQDRHGRTIWFQGDPGPLAPKGRKSRKK KSKATQLSPEDRVEDALPPSK
163	902	3	335	LTWSACYWRDILRIQLWIAADILLRMLEKALLYSEHQNISNTG LSSQGLLIFAELIPAIKRTLARLLVIIASLDYGIEKPHLGTGM HRVIGLMLLYLIFANAESVIRVIG
164	903	2	135	FFFEMESRSAAQAGVQWCNLGSLQALPPRFTPFSCLSLPSSWD Y
165	904	74	645	YECEELAKKLENSQRDGISRNKLALAELYEDEVKCKSSKSNRP KATVFKSPRTPPQRFYSSEHEYSGLNIVRPSTGKIVNELFKEA REHGAVPLNEATRASGDDKSKSFTGGGYRLGSSFCKRSEYIYG ENQLQDVQILLKLWSNGFSLDDGELRPYNEPTNAQFLESVKRG VTLIACMPEIQQLMLEIF
166	905	14	1257	WPCGAAPGLTHASERMFTLTTMIQALAPVMGWDRKPLKMFSSE EMRGHLHHHHKCLTKILKVEGQYPDLPSCLPLTDNTRMLASIL INMLYDDLRCDPERDHFRKICEEYITGKFDPQDMDKNLNAIQT VSGILQGPFDLGNQLLGLKGVMEMMVALCGSERETDQLVAVEA LIHASTKLSRATFIITNGVSLLKQIYKTTKNEKIKIRTLVGLC KLGSAGGTDYGLRQFAEGSTEKLAKQCRKWLCNMSIDTRTRRW AVEGLAYLTLDADVKDDFVQDVPALQAMFELAKTSDKTILYSV ATTLVNCTNSYDVKEVIPELVQLAKFSKQHVPEEHPKDKKDFI DMRVKRLLKAGVISALACMVKADSAILTDQTKELLARVFLALC DNPKDRGTIVAQGGGKALIPLALEGTD

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167	906	3	894	VDSVGGGSESRSLDSPTSSPGAGTRQLVKASSTGTESSDDFEE RDPDLGDGLENGLGSPFGKWTLSSAAQTHQLRRLRGPAKCREC EAFMVSGTECEECFLTCHKRCLETLLILCGHRRLPARTPLFGV DFLQLPRDFPEEVPFVVTKCTAEIEHRALDVQGIYRVSGSRVR VERLCQAFENGRALVELSGNSPHDVSSVLKRFLQELTEPVIPF HLYDAFISLAKTLHADPGDDPGTPSPSPEVIRSLKTLLVQLPD SNYNTLRHLVAHLFRVAARFMENKMSANNLGIVFGPTL
168	907	1	394	GLHVISLHSADGRHWEDPLSELDSERVSAFLVTETLVFYLFCL LADETVVPPDVPSYLSSQGTLSDRQETVVRTEGGPQANGHIES NGKASVTVKQSSAVTVSLGAGGGLQVFTGQVPGIRWGKLGEAH AS
169	908	179	551	KIKHRPEEEPRWAAAGAQSAGPGAAEVAPPRPGTVAPGANGMT DSATANGDDRDPEIELFVKAGIDGESIGNCPFSQRLFMILWLK GVVFNVTTVDLKRKPADLRNLAPGTHPPFLAFNWYVKT
170	909	1	335	LGFSDGQEARPEEIGWLNGYNETTGERGDFPGTYVEYIGRKKI SPPTPKPRPPRPLPVAPGSSKTEADVEQQVLYKYRKKPSSSHR PQTPHNGKSKNFLHKQGLKKKKASL
171	910	1	895	RTRGVMELALRRSPVPRWLLLLPLLLGLNAGAVIDWPTEEGKE VWDYVTVRKDAYMFWWLYYATNSCKNFSELPLVMWLQGGPGGS STGFGNFEEIGPLDSDLKPRKTTWLQAASLLFVDNPVGTGFSY VNGSGAYAKDLAMVASDMMGLLKTFFSCHKEFQTVPFYIFSES YGGKMAAGIGLELYKAIQRGTIKCNFAGVALGDSWISPVDSVL SWGPYLYSMSLLEDKGLAEVSKVAEQVLNAVNKGLYREATELW GKAEMIIEQVKRGNTQRRACLAFSGGYRAHGWCCQTWSLH
172	911	553	194	PGWSRSPDLVIRLPRPPKVLGLQYYHFFFFLRWSL/DSVAQAE VQWHDLRSLQAPPPGFTPFSCLSLPGSWDYRCPPPRPANFLYF **RRGFTVLARMVSIS*PRDPPASASQSAGITVLSLFFFFEME SCSVAQAGVQWRYLGSLQALPPGFTPFSCLSLPSSWDYRRPPP RPANFFVFLVETGVSPC*PGWSRSPDLVIRLPQPPKVLGLQV
173	912	1761	1	PSMKTGELEKETAPLRKDADSSISVLEIHSQKAQIEEPDPPEM ETSLDSSEMAKDLSSKTALSSTESCTMKGEEKSPKTKKDKRPP ILECLEKLEKSKKTFLDKDAQRLSPIPEEVPKSTLESEKPGSP EAAETSPPSNIIDHCEKLASEKEVVECQSTSTVGGQSVKKVDL ETLKEDSEFTKVEMDNLDNAQTSGIEEPSETKGSMQKSKFKYK LVPEEETTASENTEITSERQKEGIKLTIRISSRKKKPDSPPKV LEPENKQEKTEKEEEKTNVGRTLRRSPRISRPTAKVAEIRDQK ADKKRGEGEDEVEEESTALQKTDKKEILKKSEKDTNSKVSKVK PKGKVRWTGSRTRGRWKYSSNDESEGSGSEKSSAASEEBEEKE SEEAILADDDEPCKKCGLPNHPELILLCDSCDSGYHTALPFAP PLMIHPQMGGW\F\CPTFCPTLNLLLLEKLEDQF\QDL\DVAL KKERALPERRK\ERLVYVGI\SIENIIPPQ\EPDFSEDQEEKK KDSKKSKANLL\ERRSTRTRKCISYRFDEFDEAIDEAIEDDIK EADGGGVGRGKDISTITGHRGKDISTILDEER

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174	913	3	539	KRRGSFKMAELDQLPDESSSAKALVSLKEGSLSNTWNEKYSSL QKTPVWKGRNTSSAVEMPFRNSKRSRLFSDEDDRQINTRSPKR NQRVAMVPQKFTATMSTPDKKASQKIGFRLRNLLKLPKAHKWC IYEWFYSNIDKPLFEGDNDFCVCLKESFPNLKTRKLTRVEWGK IRRLMG
175	914	166	635	MPEYLRKRFGGIRIPIILAVLYLFIYIFTKISVDMYAGAIFIQ QSLHLDLYLAIVGLLAITAVYTVAGGLAAVIYTDALQTLIMLI GALTLMGYSFAAVGGMEGLKEKYFLALASNRSENSSCGLPRED AFHIFRDPLTSDLPWPGVLFGMSIPSLX*
176	915	673	1025	XSASATSLTLSHCVDVVKGLLDFKKRRGHSIGGAPEQRYQIIP VMCCSLLATGGADRLIHLWNVVGSRLEANQTLEGAGGSITSVD FDPSGYQVLAATYNQVAQFWK*
177	916	3	139	QKRFPSNCGRDGKLFLWGQALHIIAKLLGKWRRLGMVFFSLLL SY
178	917	1	541	VHVCSSKMGALSTERLQYYTQELGVRERSGHSVSLIDLWGLLV EYLLYQEENPAKLSDQQEAVRQGQNPYPIYTSVNVRTNLSGED FAEWCEFTPYEVGFPKYGAYVPTELFGSELFMGRLLQLQPEPR ICYLQGMWGSAFATSLDEIFLKTAGSGLSFLEWYRGSVNITDD CQKPQLHN
179	918	1	628	EFLGRPTRPAKDEGNDEGKDEGKDEGKDEGKDEGKDEGKDERK DEGKDEGKDERKDEGKDEGKDEGKDEGKDEGKDEGKDEGKDEG NDEGKDEGKDEGKDEGKDEGKDEGKDERKDEGKDEGKDERKDE GKDEGKDEGKDEGKDEGKDEGKDEGKDEGNDEGKDEGKDEGKD EGKDEGKDEGKDEGNDEGNDEGNDEGKDEGKDERNDEGKDEGK DEGKDEGKDERNDEGKDERKDEGKDEGKDEGKDEGKDEGKDEG NDEGKDERKDEGKDEGKDEGKDK
180	919	27	471	PSLRPAWHEGEDFSYGLQPYCGYSFQVVGEMIRNREVLPCPDD CPAWAYALMIEGWNEFPSRRARFKDIHSRLRAWGNLSNYNSSE QTSGGRNTTQTSSLSTSPLCNVSNAPYVGPKQKVPPFPQTQVI PMKGQIRPMVPPPQLYVP
181	920	2	454	RNSGRHPRVRWILEERKRVMQEACAKYRASSSRRAVTPRHVSR IFVEDRHRVLYCEVPKAGCSNWKRVLMVLAGLASSTADIQHNT VHYGSALKRLDTFDRQGILHRLSTYTKMLFVREPFERLVSAFR DKFEHPNSYYHPVFCMAILAR
182	921	2	378	IMYSISPANSEEGQELYVCTVKDDVNLDTVLLLPFLKEIAVSQ LDQLSPEEQLLVKCAAIIGHSFHIDLLQHLLPGWDKNKLLQVL RALVDIHVLCWSDKSQELPAEPILMPSSIDIIDGTKEKK
183	922	181	513	GPHVVLVLRRCFLLSYFKGVEKAKAMPSPRILKTHLSTQLLPP SFWENNCKVRYQQLPVTEGKVSQPKRVLQTPTQSIRDHLCLST VSDAYQQRENIKFYIQQDIHLNSFK
184	923	32	239	FYYICRLSKEDKAFLWEKRYYCFKHPNCLPKILASAPNWKWVN LAKTYSLLHQWPALYPLIALELLDSK

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185	924	3	361	KMMI*GLFEIQQCPIGKHCNFLQVLRN/PNRDL/WLVSSFGKS SKGRERMGHHDEYYRLRGR/HNPSPDHSYKRNGESERKRKKSH ·*HMSKSQERHNSPSRGRNSDRSGGRCSRSDNGRSRYR
186	925	443	1412	PLSLFARVAGSRVEMPEPPGLGDEGRPLLHPGRREAVGSWVSA FAGDSTPCGPGDLSVPRREPFRLTAL*PHRSPVVRTSLIGLLL GFSVKEELRGVGWAARTPLGIR
187	926	2	917	FDKRQHEARIQQMENEIHYLQENLKSMEEIQGLTDLQLQEADE EKERILAQLRELEKKKKLEDAKSQEQVFGLDKELKKLKKAVAT SDKLATAELTIAKDQLKSLHGTVMKINQERAEELQEAERFSRK AAQAARDLTRAEAEIELLQNLLRQKGEQFRLEMEKTGVGTGAN SQVLEIEKLNETMERQRTEIARLQNVLYLTGSDNKGGFENVLE EIAELRREGSYQNDYISSMADPFKRRGYWYFMPPPPSSKVSSH SSQATKDSGVGLKYSASTPVRKPRPGQQDGKEGSQPPPASGYW VYSP
188	927	171	1082	SDASSFKTRVIVVPRPRVFPLGSAITENSLESDSQIGQFGVGF YSAFLVADKVIVTSKHNNDTQHIWESDSNEFSVIADPRGNTLG RGTTITLVLKEEASDYLELDTIKNLVKKYSQFINFPIYVWSSK TETVEEPMEEEEAAKEEKEESDDEAAVEEEEEEKKPKTKKVEK TVWDWELMNDIKPIWQRPSKEVEEDEYKAFYKSFSKESDDPMA YIHFTAEGEVTFKSILFVPTSAPRGLFDEYGSKKSDYIKLYVR RVFITDDFHDMMPKYLNFVKGVVDSDDLPLNVSRETLQQHKLL KV
189	928	718	275	CGSWMRRALIPPCRGGPSASDRCCSCSPSGFSAGRGRCPVQGC LRPHRVQLLRRWGPGSPAGQRLSKGFQLLRWWGPGSPAPEPRK GPFPPPDPPWPVTAVTVMAGSVPSAQSVDALESPGPLALEGPS SPRNLLWREMSIFLPGIF
190	929	1	550	PGPTPPPRHGSPPHRLIRVETPGPPAPPADERISGPPASSDRL AILEDYADPFDVQETGEGSAGASGAPEKVPENDGYMEPYEAQK MMAEIRGSKETATQPLPLYDTPYEPEEDGATPEGEGAPWPRES RLPEDDERPPEEYDQPWEWKKERISKAFAVDIKVIKDLPWPPP VGQLDSSPSLP
191	930	1	562	QFFSLFLRYQIHTGLQHSIIRPTQPNCLPLDNATLPQKLKEVG YSTHMVGKWHLGFYRKECMPTRRGFDTFFGSLLGSGDYYTHYK CDSPGMCGYDLYENDNAAWDYDNGIYSTQMYTQRVQQILASHN PTKPIFLYIAYQAVHSPLQAPGRYFEHYRSIININRRRYAAML SCLDEAINNVTLALK
192	931	3	580	RVRKGRGGERLQSPLRVPQKPERPPLPPKPQFLNSGAYPQKPL RNQGVVRTLSSSAQEDIIRWFKEEQLPLRAGYQKTSDTIAPWF HGILTLKKANELLLSTGMPGSFLIRVSERIKGYALSYLSEDGC KHFLIDASADAYSFLGVDQLQHATLADLVEYHKEEPITSLGKE LLLYPCGQQDQLPDYLELFE

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193	932	3	1641	GSLEKALFQLLKVWGQWAEQTRRLQRLDVSLSVARVRSAGPSC QNKGDLVMEALLEGIQNRGHGGGFLTSCEAELQELMKQIDIMV AHKKSEWEGRTHALETCLKIREQELKSLRSQLDVTHKEVGMLH QQVEEHEKIKQEMTMEYKQELKKLHEELCILKRSYEKLQKKQM REFRGNTKNHREDRSEIERLTAKIEEFRQKSLDWEKQRLIYQQ QVSSLEAQRKALAEQSEIIQAQLVNRKQKLESVELSSQSEIQH LSSKLERANDTICANELEIERLTMRVNDLVGTSMTVLQEQQQK EEKLRESEKLLEALQEEKRELKAALQSQENLIHEARIQKEKLQ EKVKATNTQHAVEAISLESVSATCKQLSQELMEKYEELKRMEA HNNEYKAEIKKLKEQILQGEQSYSSALEGMKMEISHLTQELHQ RDITIASTKGSSSDMEKRLRAEMQKAEDKAVEHKEILDQLESL KLENRHLSEMVMKLELGLHECSLPVSPLGSIATRFLEEEELRS HHILERLDAHIEELKRESEKTVRQFTALK
194	933	159	1053	TGFLGWSQGPSLTPTSLSALYPSQVEETGVVLSLEQTEQHSRR PIQRGAPSQKDTPNPGDSLDTPGPRILAFLHPPSLSEAALAAD PRRFCSPDLRRLLGPILDGASVAATPSTPLATRHPQSPLSADL PDELPVGTENVHRLFTSGKDTEAVETDLDIAQDADALDLEMLA PYISMDDDFQLNASEQLPRAYHRPLGAVPRPRARSFHGLSPPA LEPSLLPRWGSDPRLSCSSPSRGDPSASSPMAGARKRTLAQSS KDEDEGVELLGVRPPKRSPSPEHENFLLFPLSLSFLLTG
195	934	3	425	ELQDCFDVHDASWEEQIFWGWHNDVHIFDTKTQTWFQPEIKGG VPPQPRAAHTCAVLGNKGYIFGGRVLQTRMNDLHYLNLDTWTW SGRITINGESPKHRSWHTLTPIADDKLFLCGGLNAYNMPLSDG WIHNVTTHCWK
196	935	2	295	FFFLRTRSHSVTPRWECSDDITAHWQPQPWGSSDPLTFS/RPQ VVVPPRHTTLCP\ANFFVFCIFCRNRISPCWPGWSRTPWAQLI RLPRPPKVLGLQV
197	936	2	737	PREGQVKQGLLGDCWFLCACAALQKSRHLLDQVIPPGQPSWAD QEYRGSFTCRIWQFGRWVEVTTDDRLPCLAGRLCFSRCQREDV FWLPLLEKVYAKVHGSYEHLWAGQVADALVDLTGGLAERWNLK GVAGSGGQQDRPGRWEHRTCRQLLHLKDQCLISCCVLSPRAGE ARGQHGRAAASVPPTARPQAHCSFLCDWLHSPVRTKWEEVSLF SRVVSSVCDLPLLSSSRGTWPFSPLTSPFH
198	937	3	638	AECLEASIARYAHRVANSRYTFDGETVTLSPSQGVNQLHGGPE GFDKRRWQIVNQNDRQVLFALSSDDGDQGFPGNLGATVQYRLT DDNRISITYRATVDKPCPVNMTNHVYFNLDGEQSDVRNHKLQI LADEYLPVDEGGIPHDGLKSVAGTSFDFRSAKIIASEFLADDD QRKVKGYDHAFLLQAKGDGKKVAAHVWSADEKLQLKVYT
199	938	69	425	PLSRFLSKESQEDWGMERQSRVMSEKDEYQFQHQGAVELLVFN FLLILTILTIWLFKNHRFRFLHETGGAMVYDKPPKFAMSREQM SQSCSHTAHNASLLTDAGPLSCGESRASCLFL

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200	939	3	435	DSKEPRLQQLGLLEEEQLRGLGFRQTRGYKSLAGCLGHGPLVL QLLSFTLLAGLLVQVSKVPSSISQEQSRQDAIYQNLTQLKAAV GELSEKSKLQEIYQELTQLKAAVGELPEKSKLQEIYQELTWLK AAVGELPEKSKMQE
201	940	657	469	MQSIAWGHRRDRGESPLGWGQESEASPSALTEAPKAAHTTRLG FLAANNPNGHSQPQDSFLL*
202	941	1	714	FETLSMRGIPHMLALGPQQLLAQDEEGDTLLHLFAARGLRWAA YAAAEVLQVYRRLDIREHKGKTPLLVAAAANQPLIVEDLLNLG AEPNAADHQGRSVLHVAATYGLPGVLLAVLNSGVQVDLEARDF EGLTPLHTAILALNVAMRPSDLCPRVLSTQARDRLDCVHMLLQ MGANHTIQVSGDVGGQTLGDCVEWGHLDVRELQANADFASSLL RALEHVTSLLCALRVFCLFLCQL
203	942	3	479	DAWADAWVGTKMADLDSPPKLSGVQQPSEGVGGGRCSEISAEL IRSLTELQELEAVYERLCGEEKVVERELDALLEQQNTIESKMV TLHRMGPNLQLIEGDAKQLAGMITFTCNLAENVSSKVRQLDLA KNRLYQAIQRADDILDLKFCMDGVQTALR
204	943	1	706	AVEFRVPRSGSAYLYSYVTVGELWAFTTGWNLILSYVIGTASV ARAWSSAFDNLIGNHISKTLQGSIALHVPHVLAEYPDFFALGL VLLLTGLLALGASESALVTKVFTGVNLLVLGFVMISGFVKGDV HNWKLTEEDYELAMAELNDTYSLGPLGSGGFVPFGFEGILRGA ATCFYAFVGFDCIATTGEEAQNPQRSIPMGIGISLSVCFLADF AVSSALTLMMPYYQLQPESP
205	944	1	852	GFHPNTTHYRARAAARAGAGSFVGEVSAVDKDFGPNGEVRYSF EMVQPDFELHAISGEITNTHQFDRESLMRRRGTAVFSFTVIAT DQGIPQPLKDQATVHVYMKDINDNAPKFLKDFYQATISESAAN LTQVLRVSASDVDEGNNGLIHYSIIKGNEERQFAIDSTSGQVT LIGKLDYEATPAYSLVIQAVDSGTIPLNSTCTLNIDILDENDN TPFF/LLNQHFFVDVLENMRIGELGASGTATDS\DSGDIADLY YKFTGTKHPPGTFSISPKHLGVFFLAQK
206	945	3	363	GDCYDLYGGEKFATLAELVQYYMEHHGQLKEKNGDVIELKNPL NCADPTSQRWFHGHLSGKEAEKLLTEKGKHSSFLVRESQSHPG DFVLSVCTGDDKGESNDGKSKVTHVMIHCQELK
207	946	218	717	IDSGNQNGGNDDKTKNAERNYLNVLPGEFYITRHSNLSEIHVA FHLCVDDHVKSGNITARDPAIMGLRNILKVCCTHDITTISIPL LLVHDMSEEMTIPWCLRRAELVFKCVKGFMMEMASWDGGISRT VQFLVPQSISEEMFYQLSNMLPQIFRVSSTLTLTSKH
208	947	3	368	SILPALLVTILIFMDQQITAVIVNRKENKLKKAAGYHLDLFWV GILMALCSFMGLPWYVAATVISIAHIDSLKMETETSAPGEQPQ FLGVREQRVTGIIVFILTGISVFLAPILKCIPLPV
209	948	2	575	GASRVEAGSANGMLIDGGSQIVKVQGHADGTTINKSGSQDVVQ GSLATNTTINGGRQYVEQSTVETTTIKNGGEQRVYESRALDTT IEGGTQSLNSKSTAKNTHIYSGGTQIVDNTSTSDVIEVYSGGV LDVRGGTATNVTQHDGAILKTNTNGTTVSGTNSEGAFSIHNHV ADNVLLENGGHLDINAYGS

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210	949	1	296	FFSSIQLTDDQGPVLMTTVAMPVFSKQNETRSKGILLGVVGTD VPVKELLKTIPKYKVMNDLIPEIKATEMPRALFSQSSGFKLYF GAMFLLTTITAC
211	950	3	594	SCSGTGTNACYMEDMSNIDLVEGDEGRMCINTEWGAFGDDGAL EDIRTEFDRELDLGSLNPGKQLFEKMISGLYLGELVRLILLKM AKAGLLFGGEKSSALHTKGKIETRHVAAMEKYKEGLANTREIL VDLGLEPSEADCIAVQHVCTIVSFRSANLCAAALAAILTRLRE NKKVERLRTTVGMDGTLYKIHPQY
212	951	2	2167	FVAIATNGVVPAGGSYYMISRSLGPEFGGAVGLCFYLGTTFAG AMYILGTIEILLAYLFPAMAIFKAEDASGEAAAMLNNMRVYGT CVLTCMATVVFVGVKYVNKFALVFLGCVILSILAIYAGVIKSA FDPPNFPICLLGNRTLSRHGFDVCAKLAWEGNETVTTRLWGLF CSSRFLNATCDEYFTRNNVTEIQGIPGAASGLIKENLWSSYLT KGVIVERSGMTSVGLADGTPIDMDHPYVFSDMTSYFTLLVGIY FPSVTGIMAGSNRSGDLRDAQKSIPTGTILAIATTSAVYISSV VLFGACIEGVVLRDKFGEAVNGNLVVGTLAWPSPWVIVIGSFF STCGAGLQSLTGAPRLLQAISRDGIVPFLQVFGHGKANGEPTW ALLLTACICEIGILIASLDEVAPILSMFFLMCYMFVNLACAVQ TLLRTPNWRPRFRYYHWTLSFLGMSLCLALMFICSWYYALVAM LIAGLIYKYIEYRGAKKEWGDGIRGLSLSAARYALLRLEEGPP HTKNWRPQLLVLVRVDQDQNVVHPQLLSLTSQLKAGKGLTIVG SVLEGTFLENHPQAQRAEESIRRLMEAEKVKGFCQVVISSNLR DGVSHLIQSGGLGGLQHNTVLVGWPRNWRQKEDHQTWRNFIEL VRETTAGHLALLVTKNVSMFPGNPERFSEGSIDRWGIGHDGGM LMLVPFLLRHHKVWRKCKMRIFTVAQMVDMHAM
213	952	1	128	FYLRLLSFFCFQEHEKRCWSVDFNLMDPKLLASGSDDAKGTV
214	953	3	244	RNSKAMHRSSCDGPLLSLPSVGRSATHALVQAQLICSGARRGM HAFIVPIRSLQDHTPLPGKPIMLPQGTLPGGEPRWPP
215	954	2	609	CGTLILQARAYVGPHVLAVVTRTGFCTAKGGLVSSILHPRPIN FKFYKHSMKFVAALSVLALLGTIYSIFILYRNRVPLNEIVIRA LDLVTVVVPPALPAAMTVCTLYAQSRLRRQGIFCIHPLRINLG GKLQLVCFDKTGTLTEDGLDVMGVVPLKGQAFLPLVPEPRRLP VGPLLRALATCHALSRLQDTPVGDPMDLKM
216	955	292	855	QIEYFRSLLDEHHISYVIDEDVKSGRYMELEQRYMDLAENARF EREQLLGVQQHLSNTLKMAEQDNKEAQEMIGALKERSHHMERI IESEQKGKAALAATLEEYKATVASDQIEMNRLKAQLENEKQKV AELYSIHNSGDKSDIQDLLESVRLDKEKAETLASSLQEDLAHT RNDANRLQDAIAKGRG
217	956	2	400	ARYRFTLSARTQVGSGEAVTEESPAPPNEATPTAAPPTLPPTT VGATGAVSSTDATAIAATTEATTVPIIPTVAPTTMATTTTVAT TTTTTAAATTTTESPPTTTSGTKIHESAPDEQSIWNVTVLPNS KWA

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218	957	1	662	LKSTQDEINQARSKLSQLHESRQEAHRSLEQYDQVLDGAHGAS LTDLANLSEGVSLAERGSFGAMDDPFKNKALLFSNNTQELHPD PFQTEDPFKSDPFKGADPFKGDPFQNDPFAEQQTTSTDPFGGD PFKESDPFRGSATDDFFKKQTKNDPFTSDPFTKNPSLPSKLDP FESSDPFSSSSVSSKGSDPFGTLDPFGSGSFNSAEGFADFSTI EGRRG
219	958	1	752	RTRGGSGNSSQPSLREGHDKPVFNGAGKPHSSTSSPSVPKTSA SRTQKSAVEHKAKKSLSHPSHSRPGPMVTPHNKAKSPGVRQPG SSSSSAPGQPSTGVARPTVSSGPVPRRQNGSSSSGPERSISGS KKPTNDSNPSRRTVSGTCGPGQPASSSGGPGRPISGSVSSARP LGSSRGPGRPVSSPHELRRPVSGLGPPGRSVSGPGRSISGSIP AGRTVSNSVPGRPVSSLGPGQTVSSSGPTIKPKCT
220	959	439	582	RGKGITPRYHLCISDPHNLKICCRVNGEVVQSSNTNQMVFKTE DLIAW
221	960	230	420	VVAVTRWLCENGVSYLRKCVCSACRHGTRCAGEVAAAANNSHC TVGIAFNAKIGGMGNQLTWM
222	961	311	490	GAPPPFVPTLKSDDDTSNFDEPKKNSWVSSSPCQLSPSGFSGE ELPFVGFSYSKALGIL
223	962	2	422	FVERLAHLHAACAPRRKVALLLEVCRDVYAGLARGENQDPLGA DAFLPALTEELIWSPDIGDTQLDVEFLMELLDPDELRGEAGYY LTTWFGALHHIAHYQPETDRAPRGLSSEARASLHQWHRRRTLH RKDHPRAQQLD
224	963	385	844	FWMDPYNPLNFKAPFQTSGENEKGCRDSKTPSESIVAISECHT LLSCKVQLLGSQESECPDSVQRDVLSGGRHTHVKRKKVTFLEE VTEYYISGDEDRKGPWEEFARDGCRFQKRIQETEDAIGYCLTF EHRERMFNRLQGTCFKGLNVLKQC
225	964	3	166	AASTAYSFFGTVENMAPKVVNRPGHTQSADWGSFGGLMGRFEF GIFLKGKEIVK
226	965	1	118	GFVFLPGPMSVGLDFSLPGMEHVYGIPEHADNLRLKVTE
227	966	1	390	GSECQGTDLDTRNCTSDLCVHTASGPEDVALYVGLIAVAVCLV LLLLVLILVYCRKKEGLDSDVADSSILTSGFQPVSIKPSKADN PHLLTIQPDLSTTTTTYQGSLCPRQDGPSPKFQLTNGHLLSPL G
228	967	1	777	LIYNEDMICWIESRESSNQLKCIQITKAGGLTDEWTINILQSF HNVQQMAIDWLTRNLYFVDHVGDRIFVCNSNGSVCVTLIDLEL HNPKAIAVDPIAGKLFFTDYGNVAKVERCDMDGMNRTRIIDSK TEQPAALALDLVNKLVYWVDLYLDYVGVVDYQGKNRHAVIQGR QVRHLYGITVFEDYLYATNSDSYNIVRISRFNGTDIHSLIKIE NAWGIRIYQKRTQPTVRSHACEVDPYGMPGGCSHICLLSSSYT K
229	968	3	488	SSGNPQPGDSSGGGAGGGLPSPGEQELSRRLQRLYPAVNQQET PLPRSWSPKDKYNYIGLSQGNLRVHYKGHGKNHKDAASVRATH PIPAACGIYYFEVKIVSKGRDGYMGIGLSAQGVNMNRLPGWDK HSYGYHGDDGHSFCSSGTGQPYGPTFTTGDVI

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230	969	1	228	FFFFKMGSRSVTQAGVQWCDVSSLQAPPPRFTLFCLSLPSSWD YRCVPPCPANFFVFLVETGFHRVSQYGLDLLTS
231	970	2	119	QLSLARGKVFLCALSFVYFAKALAEGYLKSTITQIERRVDIPS SLVGVIDGSFEIGNLLVITFVSYFGAKLHRPKIIGAGCVIMGV GTLLIAMPQFFMEQYKYERYSPSSNSTLSISPCLLESSSQLPV SVMEKSKSKISNECEVDTSSSMWIYVFLGNLLRGIGETPIQPL GIAYLDDFASEDNAAFYIGCVQTVAIIGPIFGFLLGSLCAKLY VDIGFVNL/DHF*VSAQLGTRKGVLVCLVFCLLCQSIGRRLSE EHHHSDREKG
232	971	221	1068	QPAGRVEAFCKFHMWAEGMTSLMKAALDLTYPITSMFSGAGFN SSIFSVFKDQQIEDLWIPYFAITTDITASAMRVHTDGSLWRYV RASMSLSGYMPPLCDPKDGHLLMDGGYINNLPADVARSMGAKV VIAIDVGSRDETDLTNYGDALSGWWLLWKRWNPLATKVKVLNM AEIQTRLAYVCCVRQLEVVKSSDYCEYLRPPIDSYSTLDFGKF NEICEVGYQHGRTVFDIWGRSGVLEKMLRDQQGPSKKPASAVL TCPNASFTDLAEIVSRIEPAKPAM
233	972	133	635	LWVIMFVSYLILTLLHVQTAVLARPGGESIGCDDYLGSDKVVD KCGVCGGDNTGCQVVSGVFKHALTSLGYHRVVEIPEGATKINI TEMYKSNNYLALRSRSGRSIINGNWAIDRPGKYEGGGTMFTYK RPNEISSTAGESFLAEGPTNEILDVYVSLDVSGLFFGF
234	973	1	420	ISGGTRSAGPLRRNYNFIAAVVEKVAPSVVHVQLWGRNQQWIE VVLQNGARYEAVVKDIDLKLDLAVIKIESNAELPVLMLGRSSD LRAGEFVVALGSPFSLQNTATAGIVSTKQRGGKELGMKDSDMD YVQIDATINYG
235	974	2	860	PRVRELKEILDRKGHFSENETRWIIQSLASAIAYLHNNDIVHR DLKLENIMVKSSLIDDNNEINLNIKVTDFGLAVKKQSRSEAML QATCGTPIYMAPEVISAHDYSQQCDIWSIGVVMYMLLRGEPPF LASSEEKLFELIRKGELHFENAVWNSISDCAKSVLKQLMKVDP AHRITAKELLDNQWLTGNKLSSVRPTNVLEMMKEWKNNPESVE ENTTEEKNKPSTEEKLKSYQPWGNVPETNYTSDEEEEKQVGRI IAAFLPSVKYPHHTWNIFLQICLFVVSL
236	975	1	467	LSISVSDVSLSDEGQYTCSLFTMPVKTSKAYLTVLGVPEKPQI SGFSSPVMEGDLMQLTCKTSGSKPAADIRWFKNDKEIKDVKYL KEEDANRKTFTVSSTLDFRVDRSDDGVAVICRVDHESLNATPQ VAMQVLEMHYTPSVKIIPSTPFPQEG
237	976	3	417	YNQKVDLFSLGIIFFEMSYHPMVTASERIFVLNQLRDPTSPKF PEDFDDGEHAKQKSVISWLLNHDPAKRPTATELLKSELLPPPQ MEESELHEVLHHTLTNVDGKAYRTIDGPRSFRQRISPAIA\YT YD\SDILKGN

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
238	977	2	740	DQDYKYDSTSDDSNFLNPPRGWDHTAPGHRTFETKDQPEYDST DGEGDWSLWSVCSVTCGNGNQKRTRSCGYACTATESRTCDRPN CPGIEDTFRTAATEVSLLAGSEEFNATKLFEVDTDSCERWMSC KSEFLKKYMHKVMNDLPSCPCSYPTEVAYSTADIFDRIKRKDF RWKDASGPKEKLEIYKPTARYCIRSMLSLESTTLAAQHCCYGD NMQLITRGKGAGTPNLISTEFSAELHYKVDV
239	978	2	612	ESEENGESAMDSTVAKEGTNVPLVAAGPCDDEGIVTSTGAKEE DEEGEDVVTSTGRGNEIGHASTCTGLGEESEGVLICESAEGDS QIGTVVEHVEAEAGAAIMNANENNVDSMSGTEKGSKDTDICSS AKGIVESSVTSAVSGKDEVTPVPGGCEGPMTSAASDQSDSQLE KVEDTTISTGLVGGSYDVLVSGEVPECEVAH
240	979	79	361	VCIICLIFSYYSFDSALQSAKSSLGGNDELSATFLEMKGHFYM YAGSLLLKMGQHGNNVQWRALSELAALCYLIAFQVSLPLGAID ISRSLDVF
241	980	2	681	QHPSQEKPQVLTPSPRKQKLNRKYRSHHDQMICKCLSLSISYS ATIGGLTTIIGTSTSLIFLEHFNNQYPASEVVNFGTWFLFSFP ISLIMLVVSWFWMHWLFLGCNFKETCSLSKKKKTKREQLSEKR IQEEYEKLGDISYPEMVTGFFFILMTVLWFTREPGFVPGWDSF FEKKGYRTDATVSVFLGFLLFLIPAKKPCFGKKNDGENQEHSL GTEPIITWKDF
242	981	1	491	LEREGDKGTPVLRGFSSVSGSWSRRMPPFLLLTCLFITGTSVS PVALDPCSAYISLNEPWRNTDHQLDESQGPPLCDNHVNGEWYH FTGMAGDAMPTFCIPENHCGTHAPVWLNGSHPLEGDGIVQRQA CASFNGNCCLWNTTVEVKACPGGYYVYRLTKPSV
243	982	1	983	CGRTMSDIRHSLLRRDALSAAKEVLYHLDIYFSSQLQSAPLPI VDKGPVELLEEFVFQVPKERSAQPKRLNSLQELQLLEIMCNYF QEQTKDSVRQIIFSSLFSPQGNKADDSRMSLLGKLVSMAVAVC RIPVLECAASWLQRTPVVYCVRLAKALVDDYCCLVPGSIQTLK QIFSASPRFCCQFITSVTALYDLSSDDLIPPMDLLEMIVTWIF EDPRLILITFLNTPIAANLPIGFLELTPLVGLIRWCVKAPLAY KRKKKPPLSNGHVSNKVTKDPGVGMDRDSHLLYSKLHLSVLQV LMTLQLHLTEKNLYGPPGADPLRPHG
244	983	32	362	SACSTGPELPGRATRSLTRPANQKGCDGDRLYYDGCAMIAMNG SVFAQGSQFSLDDVEVLTATLDLEDVRSYRAEISSRNLAVSAP VDTCVGCSSKTWKVAPFVRAWWRP
245	984	158	398	APLSRLCFPQVLVNEGGGFDRASGSFVAPVRGVYSFRFHVVKV YNRQTVQVTSALAPIPGSGGWGGGRRGAQLTSGWTLH
246	985	2	707	PHIIGAEDDDFGTEHEQINGQCSCFQSIELLKSRPAHLAVFLR HVVSQFDPATLLCYLYSDLYKHTNSKETRRIFLEFHQFFLDRS AHLKVSVPDEMSADLEKRRPELIPEDLHRHYIQTMQERVHPEV QRHLEDFRQKRSMGLTLAESELTKLDAERDKDRLTLEKERTCA EQIVAKIEEVLMTAQAVEEDKSSTMQYVILMYMKHLGVKVKEP RNLEHKRGRIGFLPKIKQSM

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
247	986	18	441	SPGTGRGPGPTSFVCLPTPQCPFIDDFILALHRKIKNEPVVFP EGPEISEELKDLILKMLDKNPETRIGVPDIKLHPWVTKNGEEP LPSEEEHCSVVEVTEEEVKNSVRLIPSWTTVILVKSMLRKRSF GNPFEPQARMA
248	987	3	732	HASGIKIDKTSDGPKLFLTEEDQKKLHDFEEQCVEMYFNEKDD KFHSGSEERIRVTFERVEQMCIQIKEVGDRVNYIKRSLQSLDS QIGHLQDLSALTVDTLKTLTAQKASEASKVHNEITRELSISKH LAQNLIDDGPVRPSVWKKHGVVNTLSSSLPQGDLESNNPFHCN ILMKDDKDPQCNIFGQDLPAVPQRKEFNFPEAGSSSGALFPSA VSPPELRQRLHGVELLKIFNKKQKKRA
249	988	3	468	CCRWIDCFALYDQQEELVRHIEKVHIDQRKGEDFTCFWAGCPR RYKPFNARYKLLIHMRVHSGEKPNKCTFEGCEKAFSRLENLKI HLRSHTGEKPYLCQHPGCQKAFSNSSDRAKHQRTHLDTKPYAC QIPGCTKRYTDPSSLRKHVKAHSSK
250	989	356	553	LPLLWTLSDFGGTMDQSGMEIPVTLIIKAPNQKYSDQTISCFL NWTVGKLKTHLSNVYPSKPVSV
251	990	1	895	AGTRMCVVAAAEELVCGA\RGLWMRRTRRPRFVLMNKMDDLNL HYRFLNWRRRIREIREVRAFRYQERFKHILVDGDTLSYHGNSG EVGCYVASRPLTKDSNYFEVSIVDSGVRGTIAVGLVPQYYSLD HQPGWLPDSVAYHADDGKLYNGRAKGRQFGSKCNSGDRIGCGI EPVSFDVQTAQIFFTKNGKRVGSTIMPMSPDGLFPAVGMHSLG EEVRLHLNAELGREDDSVMMVDSYEDEWGRLHDVRVCGTLLEY LGKGKSIVDVGLAQARHPLSTRSHYFEVEIVDPGEKCYIA
252	991	51	674	QQAEEHLAAYSVSDSDSGKDPSMECCRRATPGTLLLFLAFLLL SSRTARSEEDRDGLWDAWGPWSECSRTCGGGASYSLRRCLSSK SCEGRNIRYRTCSNVDCPPEAGDFRAQQCSAHNDVKHHGQFYE WLPVSNDPDNPCSLKCQAKGTTLVVELAPKVLDGTRCYTESLD MCISGLCQVSADLFSFNLSRGFQCLCVNGLHSLTL
253	992	2	554	RLLRQELVVLCHLHHPSLISLLAAGIRPRMLVMELASKGSLDR LLQQDKASLTRTLQHRIALHVADGLRYLHSAMIIYRDLKPHNV LLFTLYPNAAIIAKIADYGIAQYCCRMGIKTSEGTPGFRAPEV ARGNVIYNQQADVYSFGLLLYDILTTGGRIVEGLKFPNEFDEL EIQGKLPDPVKE
254	993	3	437	KASNSTHEFRIGLPEGWESEKKAVIPLGIGPPLTLICLGVLGG ILIYGRKGFQTAHFYLKDSPSPKVISTPPPPIFPISKEVGPIP IKHFPKHVANLHASRGFTEKFETLKKFYQEGQSCTVDLGITAN SSNHPDNRHRNRSLI
255	994	3	445	SFPDRTASLVLLSVPVGQAGMQQRGLAIVALAVCAALHASPAI LPIASSCCTEVSHHISRRLLERVNMCRIQRADGDCDLAAVILH VKRRRICVSPHNHTVKQWMKVQAAKKNGKGNVCHRKKHHGKRN SNRAHQGKHETYGHKTPY

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine; C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
256	995	2	737	FEQPGNPGDPRVRTPPPWGPHFFALIPSSPKEVPATPSSRRDP IAPTATLLSKKTPATLAPKEALIPPAMTVPSPKKTPAIPTPKE APATPSSKEASSPPAVTPSTYKGAPSPKELLIPPAVTSPSPKE APTPPAVTPPSPEKGPATPAPKGTPTSPPVTPSSLKDSPTSPA SVTCKMGATVPQASKGLPAKKGPTALKEVLVAPAPESTPIITA PTRKGPQTKKSSATSPPICPDPSAKNGSKG
257	996	79	3	FFLKIQGLGWARWLTPVIPVLWEAE
258	997	307	475	AGFGYGLPISRLYAKYFQGDLNLYSLSGYGTDAIIYLKVSLEF NSKILFLKPLLLL
259	998	26	622	WMRAPMLQKQQAPRMDTPPPEERLEKQNEKLNNQEETEFKEL DGLREALANLRGLSEEERSEKAMLRSRIEEQSQLICILKRRSD EALERCQILELLNAELEEKMMQEAEKLKAQGEYSRKLEERFMT LAANHELMLRFKDEYKSENIKLREENEKLRLENNSLFSQALKD EEAKVLQLTVRCEALTGELETLKERC
260	999	2	241	DPGASHASVQVQVLKEQLFAGRMPSPFRSCALMGMCGSRSADN LSCPSPLNVMEPVSFFPLKSLGKGMIQHFRHIVSLV
261	1000	1	620	VTTTTHSVGRGHELQLLNEELRNIELECQNIMQAHRLQKVTDQ YGDIWTLHDGGFRNYNTSIDMQRGKLDDIMEHPEKSDKDSSSA YNTAESCRSTPLTVDRSPDSSLPRVINLTNKKNLRSTMAATQS SSGQSSKESTSTKAKTTEQGCSAESKEKVLEGSKLPDQEKAVS EHIPYLSPYHSSSYRYANIPAHARHYQSYMQLIQ
262	1001	3	420	VWGCLATVSTHKKIQGLPFGNCLPVSDGPFNNSTGIPFFYMTA KDPVVADLMKNPMASLMLPESEGEFCRKNIVDPEDPRCVQLTL TGQMIAVSPEEVEFAKQAMFSRHPGMRKWPRQYEWFFMKMRIE HIWLQKWYG
263	1002	43	441	QAANMAVARVDAALPPGEGSVVNWSGQGLQKLGPNLPCEADIH TLILDKNQIIKLENLEKCKRLIQLSVANNRLVRMMGVAKLTLL RVLNLPHNSIGCVEGLKELVHLEWLNLAGNNLIAMEQINSCTA LQHL
264	1003	3	834	FRAAVGAVPEGAWKDTAQLHKSEEAKRVLRYYLFQGQRYIWIE TQQAFYQVSLLDHGRSCDDVHRSRHGLSLQDQMERKAIYGPNV ISIPVKSYPQLLVDEAFSIALWLADHYYWYALCIFLISSISIC LSLYKTRKQSQTLRDMVKLSMRVCVCRPGGEEEWVDSSELVPG DCLVLSQEGGLMPCDAALVAGECMVNDSSLTGESIPVLKTALP EGLGPYCAETHRRHTLFCGTLILHARAYVGPHVLAVVTRTGMS REAGLERDPGSAPLKRWS
265	1004	2	670	FVGGGLHLHLCLLLCFMLPEDAAMAVLTASNHVSNVTVNYNIT VERMNRMQGLRVSTVPAVLSPNATLALTAGVLVDSAVEVAFLW TFGDGEQALHQFQPPYNESFPVPDPSVAQVLVEHNVTHTYAAP GEYVLTVLASNAFENRTQQVLIRSGRVPIVSLECVSCKAQAVY EVSRSSYVYLEGRCLNCSSGSKRGRWAARTFSNKTLVLDETTT STGSASM

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
266	1005	2	1093	PEFLGRLFRGKAATLHVHSDQKPLHDGALGSQQNLVRMKEALR ASTMDVTVVLPSGLEKRSVLNGSHAMMDLLVELCLQNHLNPSH HALEIRSSETQQPLSFKPNTLIGTLNVHTVFLKEKVPEEKVKP GPPKVPEKSVRLVVNYLRTQKAVVRVSPEVPLQNILPVICAKC EVSPEHVVLLRDNIAGEELELSKSLNELGIKELYAWDNRRETF RKSSLGNDETDKEKKKFLGFFKVNKRSNSKGCLTTPNSPSMHS RSLTLGPSLSLGSISGVSVKSEMKKRRAPPPPGSGPPVQDKAS EKVSLGSQIDLQKKKRRAPAPPPPQPPPPSPLIPNRTEDKEEN RKSTMVYCCASFPTQAKRF
267	1006	686	400	VQWHNLHSLQPLPAGFK*FLCFSLPSSWDYRCAPPLP/APFFF YFLFLVELGFHHIG*AGLELTSTDLPASAS/ESAGITGMSHRA RPMDFFLLKIL
268	1007	1	453	GRRFRPPSDEEREPWEPWTQLRLSGHLKPLHYNLMLTAFMENF TFSGEVNVEIACRNATRYVVLHASRVAVEKVQLAEDRAFGAVP VAGFFLYPQTQVLVVVLNRTLDAQRNYNLKIIYNALIENELLG FFRSSYVLHGERRFLGVTQFSP
269	1008	333	526	KELDPFYNS*RKIKYLRIYLTKEVKDLYKENYKTLLKEITDDT N/KKHIPSSWTGRINTVKMTIL
270	1009	699	882	VPHPLQAIHEQMNCKEYQEDLALRAQNDAAARRPSEMFKVRLA QGRGLASLSSGIQSGVG
271	1010	16	148	RWNSLTCVVLTFLGHRLLKRFLVPKLRRFLKPQGHPRLLLWFK R
272	1011	1	659	YGEFVTYQGVAVTRSRKEGIAHNYKNETEWRANIDTVMAWFTE EDLDLVTLYFGEPDSTGHRYGPESPERREMVRQVDRTVGYLRE SIARNHLTDRLNLIITSDHGMTTVDKRAGDLVEFHKFPNFTFR DIEFELLDYGPNGMLLPKEGRLEKVYDALKDAHPKLHVYKKEA FPEAFHYANNPRVTPLLMYSDLGYVIHGVSRLLEAPPPGAPSP GSGS
273	1012	146	413	RIPLLRLRSSTYRSKGFDVTVKHSHGSWTGPGGEDLATIPKGL NTYFLVNIATIFESKNFFLPGIKWNGILGLSYATLAKPSSSLE TFF
274	1013	3	251	IKSYSGPNGRSCQIWQRLRWGSRELLLGWKLSHSFSTCPFQFP DIVEFCEAMANAGKTVIVAALDGTFQRKVRRLIQVWSWD
275	1014	326	651	YCFCFDLLH*CIHRDVKPENILITKHSVIKLCDFGFARLLTGP SDYYTDYVATRWYRSPELPVGDTQY\GPPV\DVW\AIGCVSAE \LLSGKCLWWPGKS/DMLDQLYLIRK
276	1015	224	435	RGWALDWIGADLSLHLQEEVETEVAWEECGHVLLSLCYSSQQG GLLVGVLRCAHLAPMDANGYSDPFVRL
277	1016	2	429	GGILAMEYAPGGTLAEFIQKRCNSLLEEETILHFFVQILLALH HVHTHLILHRDLKTQNILLDKHRMVVKIGDFGISKILSSKSKA YTVVGTPCYISPELCEGKPYNQKSDIWALGCVLYELASLKRAF EAANLPALVLKIM

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corre-sponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corre-sponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
278	1017	1	262	VQCGGIHQVSGAVVVSGLLQGMMGLLGSPGHVFPHCGPLVLAP SLVVAGLSAHREVAQFCFTHWGLALLYVSPERRGMVPSGGVWG D
279	1018	1	480	PRMTGSTHASAPSYGGSCRNNLFYREETYTPKAETDEMNEVET APIPEENHVWLQPRVMRPTKPKKTSAVNYMTQVVRCDTKMKDR CIGSTCNRYQCPAGCLNHKAKIFGSLFYESFASICRAAIHYGI LDDKGGLVDITRNGKVPFFVKSERHGVQSLR
280	1019	271	792	VPQNIICAFFCVPCRFASTIPFWGLTLHLQHLGNNVFLLQTLF GAVTLLANCVAPWALNHMSRRLSQMLLMFLLATCLLAIIFVPQ EMQTLRVVLATLGVGAASLGITCSTAQENELIPSIIRGRATGI TGNFANIGGALASLVMILSIYSRPLPWIIYGVFAILSGLVVLL LP
281	1020	2	679	VLVSRDHMKSAQQFFQLVGGSASECDTIPGRQCMASCFFLLKQ FDDVLIYLNSFKSHFYNDDIFNFNYAQAKAATGNTSEGEEAFL LIQSEKMKNDYIYLSWLARGYIMNKKPRLAWELYLKMETSGES FSLLQLIANDCYKMGQFYYSAKAFDVLERLDPNPEYWEGKRGA CVGIFQMIIAGREPKETLREVLHLLRSTGNTQVEYMIRIMKKW AKENRVSILK
282	1021	3	359	LKVSDELVQQYQIKNQCLSAIASDAEQEPKIDPYAFVEGDEEF LFPDKKDRQNSEREAGKKHKVREITVHQRVTVDFVALHIVTLL LPQLSHFFCLRIERVIIYLEKPIFARLRWLMP
283	1022	3	538	GVPRNLPSSLEYLLLSYNRIVKLAPEDLANLTALRVLDVGGNC RRCDHAPNPCMECPRHFPQLHPDTFSHLSRLEGLVLKDSSLSW LNASWFRGLGNLRVLDLSENFLYKCITKTKAFQGLTQLRKLNL SFNYQKRVSFAHLVSGPPFLRGSLGRPLKGAGTWHGNLSFPLH FEWGKT
284	1023	3	442	ILFAALIWSSFDENIEASAGGGGGSSIDAVMVDSGAVVEQYKR MQSQESSAKRSDEQRKMKEQQAAEELREKQAAEQERLKQLEKE RLAAQEQKKQAEEAAKQAELKQKQAEEAAAKAAADAKAKAEAD AKAAEEAAKKAAADAKK
285	1024	1	119	AMEIVHEPRDLERYMREAVKVSNDSPVLLDRFLNDAIEC
286	1025	67	227	MLSPGYDYGYVCVEFSLLEDAIGCMEANQVALYFGQMMLEGYI FLYMGREGFK
287	1026	2	1101	PRVRSSGGQEDPASQQWARPRFTQPSKMRRRVIARPVGSSVRL KCVASGHPRPDITWMKDDQALTRPEAAEPRKKKWTLSLKNLRP EDSGKYTCRVSNRAGAINATYKVDVIQRTRSKPVLTGTHPVNT TVDFGGTTSFQCKVRSDVKPVIQWLKRVEYGAEGRHNSTIDVG GQKFVVLPTGDVWSRPDGSYLNKLLITRARQDDAGMYICLGAN TMGYSFRSAFLTVLPDPKPPGPPVASSSSATSLPWPVVIGIPA GAVFILGTLLLWLCQAQKKPCTPAPAPPLPGHRPPGTARDRSG DKDLPSLAALSAGPGVGLCEEHGSPAAPQHLLGPGPVAGPKLY PKLYT\DIPHHTHTHTPHPPAN
288	1027	3	96	NFHFTGKCLFMSGLSEVQLTHMDDHTLPGY

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289	1028	95	407	SPRKRKTRHSTNPPLECHVGWVMDSRDHGPGTSSVSTSNASPS EGAPLAGSYGCTPHSFPKFQHPSHELLKENGFTQQVYHKYRRR CLSERKRLGIGQSQEMNT
290	1029	1	359	PGSGGSAGGRDGSAYQGALLPREQFAAPLGRPVGTSYSATYPA YVSPDVAQSWTAGPFDGSVLHGLPGRRPTFVSDFLEEFPGEGR ECVNCGALSTPLWRRDGTGHYLCNACGLYHKMN
291	1030	2	513	PDHRHGALWWWYSCGVLPVTVSRNEGDERNQVLTLYLWIRQEW TDAYLRWDPNAYGGLDAIRIPSSLVWRPDIVLYNKYCLS/AAP PLSYPSLDLPLAVGV**SPLPTT*PGCHAALEAFPQDPSKLPS TQPLHGTPTLGYPRPAQAERLLGTYCVVQGRCLNHKGLSRAHF
292	1031	1	595	YALTGALVIVTGMVMGNIADYFNLPVSSMSNTFTFLNAGILIS IFLNAWLMEIVPLKTQLRFGFLLMVLAVAGLMFSHSLALFSAA MFILGVVSGITMSIGTFLVTQMYEGRQRGSRLLFTDSFFSMAG MIFPMIAAFLLARSIEWYWVYACIGLVYVAIFILTFGCEFPAL CSHATKLGTASSYPSLDVVQLRTLNA
293	1032	71	479	MAKVGLKTEHYDRYPHMFSGGQRQRIAIARGLMLDPDVVIADE PVSALDVSVRAQVLNLMMDLQQELGLSYVFISHDLSVVEHIAD EVMVMYLGRCVEKGTKDQIFNNPRHPYTQALLSATPRLNPDDR RERIKLSX*
294	1033	2	427	SATLERVLNHPDETQARRLMTLEDIVSGYSNVLISLADSQGKT VYHSPGAPDIREFTRDAIPDKDAQGGEVYLLSGPTMMMPGHGH GHMEHSNWRMINLPVGPLVDGKPIYTLYIALSIDFHLHYINDL MNKLIMTASVII
295	1034	3	342	VLAYPGIKVSTAEARAILPAQYRRQDCIAHGRHLAGFIHACYS RQPELAAKLMKDVIAEPYRERLLPGFRQARQAVAEIGAVASGI SGSGPTLFALCDKPETAQRVADWLGK
296	1035	2	279	GQQQRVALARALILKPKVLLFDEPLSNLDANLRRSMRDKIREL QKQFDITSLYVTHDQSEAFAVSDTVLVMNKGHIMQIGSPQDLR VRRLNW
297	1036	3	157	AVHYLERVRIAEHAHKFPGQISGGQQQRVAIARSLCMKPKIML FDEPTSAL
298	1037	1	217	APYDAENYFDYDNLNNGPSLQHWFGVDSLGRDIFSRVLVGAQI SLAAGVFAVFIGAAIGTLLGLLAGYYEGW
299	1038	3	570	VFCLIADLDPIDELVDFPIVYASALNGIAGLDHEDMAEDMTPL YQAIVDHVPAPDVDLDGPFQMQISQLDYNSYVGVIGIGRIKRG KVKPNQQVTIIDSEGKTRNAKVGKVLGHLGLERIETDLAEAGD IVAITGLGELNISDTVCDTQNVEALPALSVDEPTVSMFFCVNT SPFCGKEGKFVTSRQI
300	1039	1	366	QGTRAESQGSSKDKTRLAFAGLKFGDYGSIDYGRNYGVAYDIG AWTDVLPEFGGDTWTQTDVFMTQRATGVATYRNNDFFGLVDGL NFAAQYQGKNDRSDFDNYTEGNGHGFGFSATYEYEG
301	1040	3	201	DTYSVSIPLGATINMAGAAITITVLTLAAVNTLGIPVDLPTAL LLSVVASLCACGASGVAGGSLL

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302	1041	1	140	ANAQQGLPSGITLKLNNLVDKGLVDRLYAASSSGVPVNLLVRG TCS
303	1042	2	442	ARMTLIPGTHLLENIHNIWVNGVGTNSAPFWRMLLNSFVMAFS ITLGKITVSMLSAFAIVWFRFPLRNLFFWMIFITLMLPVEVRI FPTVEVIANLQMLDSYAGLTLPLMASATATFLFRKLNMSGPDK VVPAARISGYGPRVRKQ
304	1043	2	403	CAKCLRDADECPSGAFERIGRDISLDALEREVMKDDIFFRTSG GGVTLSGGEVLMQAEFATRFLQRLRLWGVSCAIETAGDAPASK LLPLAKLCDEVLFDLKIMDATQARDVVKMNLPRVLENLRLLVS EGVN
305	1044	1	346	YLLLFVCFLVMSLLVGLVYKFTAERAGKQSLDDLMNSSLYLMR SELREIPPHDWGKTLKEMDLNLSFDLRVEPLSKYHLDDISMHR LRGGEIVALDDQYTFLQRIPRSHYVLAVG
306	1045	1	207	VELFLSDEGDDVVIEVADQGCGVPESLRDKIFEQGVSTRADEP GEHGIGLYLIASYVTRCGGVITLEDN
307	1046	3	213	DAIIAPDANALPAAAQAAENLKNDKVAIVGFSTPNVMRPYVER GTVKEFGLWDVVQQGKISVYVADALQ
308	1047	1	129	YIVVTGKTHCGTPLTTVTGDATQSGYLTLNLPEMWEVSGYNRV
309	1048	271	46	XEGVEPDINASKTRQQLNDVAGKMKIIEARLSALTNNQTKSLK LNPVALPKVASQLLDELGYSLLARRADLQSAHX*
310	1049	16	253	ENIAEEYATKRYRSNVINWGMLPLQMAEVPTFEVGDYIYIPGI KAALDNPGTTFKGYVIHEDAPVTEITLYMESQEART
311	1050	2	299	LQTEIGSMVYAVKPGDGSAREQAASCQRVIGGLANIAEEYATK RYRSNVINWGMLPLQMAEVPTFEVGDYIYILGFKAAKYSPGTA FTVYAISGYGPRI
312	1051	1	344	TLEDLLMALDGEQHLQQQVSEKVLADNVLIAPGSVKPDATFWS ALIQDRYNVMTCIEKDACVLVEQDLNSDGQAERILFAFNDDRV IVYGFDSDRKEWDALDMSLLPNEITKEK
313	1052	2	630	ESNSRCRKMPGERCRGGPARLSLLLDLPTRPLPHPRQVIDFGS ASIFSEVRYVKEPYIQSRFYRAPEILLGLPFCEKVDVWSLGCV MDELHLGWPLYPGNNEYDQVRYICETQGLPKPHLLHAACKAHH FFKRNPHPDAANPWQLKSSADYLAETKVRPLERRKYMLKSLDQ IETVNGGSVASRLTFPDREALAEHADLKSMVEL/MKRLL
314	1053	1	302	RLVKKRVECRQCGKAGRNQSTLKTHMRSHTGEKPYECDHCGKA FSIGSNLNVHRRIHTGEKPYECLVCGEAFSDHSSLRSHVKTHR GEKLFVSSVWKRLQ
315	1054	1318	730	CGPGFSLSFFFLRWSF\ALVAQAGVQWHDLGSLQPPAPGFKRF SSLSLLSRWDYRHAHARLIFVFLVEMGFLHVGQAGLELPTSGD PPTSASQSARITGVTTPLGTFFFFLRWSFALVAQAGGQCLDLG SLQLPPPGFKRLVCHFQTPQKHRCSCQAPGDCLQESFVMTGCV LRTVSESVQRANAGAGAETVQGL

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316	1055	2486	1429	MGNAAAAKKGSEQESVKEFLAKAKEDFLKKWESPAQNTAHLDQ FERIKTLGTGSFGRVMLVKHKETGNHYAMKILD*QKVGKLKQI EHTLNEKRILQAVNFPFLVKLEFSFKDNSNLYMVMEYVPGGEM FSHLRRIGRFSEPHARFYAAQIVLTFEYLHSLDLIYRDLKPEN LLIDQQGYIQVTDFGFAKRVKGRTWTLCGTPEYLAPEIILSKG YNKAVDWWALGVLIYEMAAGYPPFFADQPIQIYEKIVSGKVRF PSHFSSDLKDLLRNLLQVDLTKRFGNLKNGVNDIKNHKWFATT DWIAIYQRKVEAPFIPKFKGPGDTS\NFDDYEEEEIRV\SINE KFG\KEFSEF
317	1056	867	461	SSSRSSHGDSPPHSQTPCDTNRGLDTKH*/DSQSIEEKDSSQS E*NRIERRKEVERILQTNSDYM*HWSN*PENILPKKFFSKHQK CTATLSMRNTSIM/KKEGLF*AQFPSLLLSHLPAVGLGIYTGT HLTTSTSTF
318	1057	544	784	TFHSSLEKNILQPCR*RRA\ICLPLLL*PSVPLLAPQYFSDLR NSIVNSQPPEKQQAMHLCFENLMEGIERNLLTKNRDR
319	1058	1606	228	GTSGVQQEISRLTNENLDLKELVEKLEKNERKLKKQLKIYMKK AQDLEAAQALAQSERKRHELNRQVTVQRKEKDFQGMLEYHKED EALLIRNLVTDLKPQMLSGTVPCLPAYILYMCIRHA\DYTNDD LKVHSLLTSTINGIKKVLKKHNDDFEMTSFWLSNTC\RLLHCL KQYSGDEGFMTQNTAKQN\EHCLKNFDLTEYRQV\L\SDLSIQ IYQQLIKIAEGVLQPMIVSAMLEN*SIQGLSGVKPTGSQKHSS SMADEDNSYRLEAIIRQMNAFHTVMCDQGLDPEIILQVFKQLF YMINAVTLNDLLLRKDVCSWSTGMQLRYNISQLEEWLRGRNLH QSGAVQTMEPLIQAAQLLQLKKKTQEDAEAICSLCTSLSTQQI VKILNLYTPLNEFEERVTVAFIRTIQAQLQERNDPQQLLLDAK HMFPVLFPFNPSSLTMDSIHIPACLNLEFLNEV
320	1059	3	250	HEENTILKAAEVQVPPK*VVTPEAKAFI*RCLAYQKEDCIDAQ QLACDP\YLLHYIQKLVFVSSPAGAAIASTFGVSNSCSSN
321	1060	1332	500	GTTDEIMTRWARVSTTYNKRPLPATSWEDMKKGSFEGTSQNLP KRKQLEANRLSLKNDAPQAKHKKNKKKKEYLNEDVNGFMEYLR QNSQMVHNGQIIATDSEEVREEIAVALKKDSRREGRRLKRQAA KKNAMVCFHCRKPGHGIADCPAALENQDMGTGICYRCGSTEHE ITKCKAKVDPALGEFPFAKCFVCGEMGHLSRSCPDNPKGLYAD GGGCKLCGSVEHLKKDCPESQNSERMVTVGRWAKGMSADYEEI LDVPKPQKPKTKIPKVVNF
322	1061	384	102	DHVRKSLLKNRAENIVNIFKCNVVSLPNLPAFGQAQWLTPVIP ALWEAEVGGS*GQEIETILANAVK/SPFLLKIQKKKISRAWWR AP/VSPRYSGG

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323	1062	1	777	SDAWADAWARSLSVSPSSYPELHTEVPLSVLILGLLVVFILSV CFGAGLFVFVLKRRKGVPSVPRNTNNLDVSSFQLQYGSYNTET HDKTDGHVYNYIPPPVVQMCQNPIYMAGREGRPSSLLPKPGKE FQLLGNLEEKKEEPATPAYTISATELLEKQATPREPELLYQNI AE/PSQGTS/TAQA*STITFVPYLKGQFAPSYESRRQNQDRIN KTVLYGTPRKCFVGQSKPNHPLLQAKPQSEPDYLEVLEKQTAI SQL
324	1063	1	1496	ALCHIAVGQQMNLHWLHKIGLVVILASTVVAMSAVAQLWEDEW EVLLISLQGTAPFLHVGAVAAVTMLSWIVAGQFARAERTSSQV TILCTFFTVVFALYLAPLTISSPCIMEKKDLGPKPALIGHRGA PMLAPEHTLMSFRKALEQKLYGLQADITISLDGVPFLMHDTTL RRTTNVEEEFPELARRPASMLNWTTLQRLNAGQWFLKTDPFWT ASSLSPSDHREAQNQSICSLAELLELAKGNATLLLNLRDPPRE HPYRSSFINVTLEAVLHSGFPQHQVMWLPSRQRPLVRKVAPGF QQTSGSKEAVASLRRGHIQRLNLRYTQVSRQELRDYASWNLSV NLYTVNAPWLFSLLWCAGVPSVTSDNSHTLSQVPSPLWIMPPD EYCLMWVTADLVSFTLIVGIFVLQKWRLGGIRSYNPEQIMLSA AVRRTSRDVSIMKEKLIFSEISDGVEVSDVLSVCSDNSYDTYA NSTATPVGPRGGGSHTKTLIERSGR
325	1064	1899	776	NSADYGDGPDSSDADPDSGTEEGVLDFSDPFSTEVKPRILLMG LRRSGKSSIQKVVFHKMSPNETLFLESTNKICREDVSNSSFVN FQIWDFPGQIDFFDPTFDYEMIFRGTGALIFVIDSQDDYMEAL ARLHLTVTRAYKVNTDINFEVFIHKVDGLSDDHKIETQRDIHQ RANDDLADAGLEKIHLSFYLTSIYDHSIFEAFSKVVQKLIPQL PTLENLLNIFISNSGIEKAFLFDVVSKIYIATDSTPVDMQTYE LCCDMIDVVIDISCIYGLKEDGAGTPYDKESTAIIKLNNTTVL YLKEVTKFLALVCFVREESFERKGLIDYNFHCFRKAIHEVFEV RMKVVKSRKVQNRLQKKKRATPNGTPRVLL
326	1065	1181	346	RTRGRDPGAGFRRTANKRCCRRRFLIGCGWLPLRSDWPLVSKM LSKGLKRKREEEEEKEPLAVDSWWLDPGHAAVAQAPPAVASSS LFDLSVLKLHHSLQQSEPDLRHLVLVVNTLRRIQASMAPAAAL PPVPSPPAAPSVADNLLASSDAALSASMASLLEDLSHIEGLSQ APQPLADEGPPGRSIGGAAPSLGALDLLGPATGCLLDDGLEGL FEDIDTSMYDNELWAPASEGLKPGPEDGPGKEEAPELDEAELD YLMDVLVGTQALERPPGPGR

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327	1066	1844	337	LQEVKARRNTLHKEKDHLVNDYEQNMKLLQTKYDADINLLKQE HALSASKASSMIEELEQNVCQLKQQLQESELQRKQQLRDQENK FQMEKSHLKHIYEKKAHDLQSELDKGKEDTQKKIHKFEEALKW KKWRQI*LDPN/LLREKQSKEFLWQLEDIRQRYEQQIVELKLE HEQEKTHLLQQHNAEKDSLVRDHEREIENLEKQLRAANMEHEN QIQEFKKRDAQVIADMEAQVHKLREELINVNSQRKQQLVELGL LREEEKQRATREHEIVVNKLKAESEKMKIELKKTHAAETEMTL EKANSKLKQIEKEYTQKLAKSSQIIAELQTTISSLKEENSQQQ LAAERRLQDVRQKFEDEKKQLIRDNDQAIKVLQDELENRSNQV RCAEKKLQHKELESQEQITYIRQEYETKLKGLMPASLRQELED TISSLKSQVNFLQKRASILQEE/RDYISRQKVQPISR*LHERM QRMRISRLCCGTSSSRFEDLDIVNCEISGIF
328	1067	1149	238	VINLVYLISSPRPELKPVDKESEVVMKFPDGFEKFSPPILQLD EVDFYYDPKHVIFSRLSVSADLESRICVVGENGAGKSTMLKLL LGDLAPVRGIRHAHRNLKIGYFSQHHV\EQL\DLNVQCLWELA GHASFPG\RPEEEY\RHQLGFGMGISGEL\AMRPLCQPVLGAR KKPKWPFAQMDYCPAPTFYIL\DEPTN\HLGHGRAIEALGPCL QTISGVGVILVSHE*SALSRLVCRE\LWVC*G\GGVTRVERKD FDQYRALLQGTVSAREGFPLGPPRLKDSPRDMGLVSQTPWGHH VGYPLPGRG
329	1068	26	674	CSAVEVKMAARTAFGAVCRRLWQGLGNFSVNTSKGNTAKNGGL LLSTNMKWVQFSNLHVDVPKDLTKPVVTISDEPDILYKRLSVL VKGHDKAVLDSYEYFAVLAAKELGISIKVHEPPRKIERFTLLQ SVHIYKKHRVQYEMRTLYRCLELEHLTGSTADVYLEYIQRNLP EGVAMEVTKFCFFIFL\TQLEQLPEHIKEPIWETLSEEKEESK S
330	1069	2105	1283	DFWDTAGQERFQSMHASYYHKTHACIMVFDVQRKVTHRNLSTW YTELREFRPEIPCIVVANKIDGGAIPAPGC*QFTGDLPSYISS SIPRAGNLQ*LVLPPTIRYNPWLVACILPTL*RSQLSRPALFP RHRSLLTELFLGPVSQSSLPIPLSGMKASSGPPLQTFFPSLDR QTNVLPSLY\ADINVTQKSFNFAKKFSLPLYFVSAADGTNVVK LFNDAIRLAVSYKQNSQDFMDEIFQELENFSLEQEEEDVPDQE QSSSIETPSEEVASPHS
331	1070	1	1109	GATPLGSVGGRTGKMDAATLTYDTLRFAEFEDFPETSEPVWIL GRKYSIFTEKDEILSDVASRLWFTYRKNFPAIGGTGPTSDTGW GCMLRCGQMIFAQALVCRHLGRDWRWTQRKRQPDSYFSVLNAF IDRKDSYYSIHQIAQMGVGEGKSIGQWYGPNTVAQVLKKLAVF DTWSSLAVHIAMDNTVVMEEIRRLCRTSVPCAGATAFPADSDR HCNGFPAGAEVTNRPSPWRPLVLLIPLRLGLTDINEAYVETLK HCFM\MPQSLGVIGGKPNSAH\YFIG*VG\EELIYLDPHTTQP AVEPTDGCFIPDESFHCQHPPCRMSIAELDPSIAVVRGGHLST QAFGAECCLGMTRKTFGFLRFFFSMLG
332	1071	39	284	ALCVVPFNTFHN\DFLLLDKEGTLDPVMDSFSTHWTTIGPADM FFS\FRQHYKNFKSHGTNPSKSVWAHATCQSCAFPNLLGW

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333	1072	2	1484	TRLAEFGTRDPCAQAPCEQQCEPGGPQGYSCHCRLGFRPAEDD PHRCVDTDECQIAGVCQQMCVNYVGGFECYCSEGHELEADGIS CSPAGAMGAQASQDLGDELLDDGEDEEDEDEAWKAFNGGWTEM PGILWMEPTQPPDFALAYRPSFPEDREPQIPYPEPTWPPPLSA PRVPYHSSVLSVTRPVVVSATHPTLPSAHQPPVIPATHPALSR DHQIPVIAANYPDLPSAYQPGILSVSHSAQPPAHQPPMISTKY PELFPAHQSPMFPDTRVAGTQTTTHLPGIPPNHAPLVTTLGAQ LPPQAPDALVLRTQATQLPIIPTAQPSLTTTSRSPVSPAHQIS VPAATQPAALPTLLPSQSPTNQTSPISPTHPHSKAPQIPREDG PSPKLALWLPSPAPTAAPTALGEAGLAEHSQRDDRWLLVALLV PTCVFLVVLLALGIVYCTRCGPHAPNKRITDCYRWVIHAGSKS PTEPMPPRGSLTGVQTCRTSV
334	1073	1	1406	LRVRRRPHLPAPPALRARRSDRRSSRAPAAFPPRPPHASPAPG PAMAQAVWSRLGRILWLACLLPWAPAGVAAGLYELNLTTDSPA TTGAVVTISASLVAKDNGSLALPADAHLYRFHWIHTPLVLTGK MEKGLSSTIRVVGHVPGEFPVSVWVTAADCWMCQPVARGFVVL PITEFLVGDLVVTQNTSLPWPSSYLTKTVLKVSFLLHDPSNFL KTALFLYSWDFGDGTQMVTEDSVVYYNYSIIGTFTVKLKVVAE WEEVEPDATRAVKQKTGDFSASLKLQETLRGIQVLGPTLIQTF QKMTVTLNFLGSPPLTVCWRLKPECLPLEEGECHPVSVASTAY NLTHTFRDPGDYCFSIRAENIISKTHQYHKIQVWPSRIQPAVF AFPCATLITVMLAFIMYMTLRNATQQKDMVENPEPPSGVRCCC QMCCGPFLLETPSEYLEIVRENHGLLPPLYKSVKTYTV
335	1074	1	866	VVEFAFQLSSVSVCLTVSFGWQLGTVSSCLSRDWFLKGNLLII IVSVLIILPLALMKHLGYLGYTSGLSLTCMLFFLVSVIYKKFQ LGCAIGHNETAMESEALVGLPSQGLNSSCEAQMFTVDSQMSYT VPIMAFAFVCHPEVLPIYTELCRPSKRRMQAVANVSIGAMFCM YGLTATFGYLTFYSSVKAEMLHMYSQKDPLILCVRLAVLLA\V TLTVPVVLFPIRRALQQLLFPGKAFSWPRHVAIALILLVLVNV LVICVPTIRDIFGVIGSTSAPSLIFILPSCI
336	1075	3	825	GAGSKSSMMQLMHLESFYEK\PPPGLIKEDDTKPEDCIPDVPG NEHAREFLAHTPTKGLWMPLEKEVKVKH/CTFHWIAS*FLGDG KFIPKATRLKDVWVSN*FTCLFWDLTRFIHDCIFF*NWSLMNK NFNIIY*FFISLR*NTLILQKYFPFSLLLGWHCKWYGHRTGYK ECPFFIKDNQKLQQFRVAHEDFMYDIIRDNKQHEKNVRIQQLK QLLEDSTSGEDRSSSSSSEGKEKHKKKKKKEKHKKRKKEKKKK KKRKHKSSKSNEGSDSE

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337	1076	3	2451	EIAGAAAENMLGSLLCLPGSGSVLLDPCTGSTISETTSEAWSV EVLPSDSEAPDLKQEERLQELESCSGLGSTSDDTDVREVSSRP STPGLSVVSGISATSEDIPNKIEDLRSECSSDFGGKDSVTSPD MDEITHDFLYILQPKQHFQHIEAEADMRIQLSSSAHQLTSPPS QSESLLAMFDPLSSHEGASAVVRPKVHYARPSHPPPDPPILEG AVGGNEARLPNFGSPMF*LPAEMEAFKQRHS/YTPERLVRSRS S\DIVSSVRRPMSDPSWNRRP\GNEERELPPAAAIGATSLVAA PHSSSSSPSKDSSRGETEERKDSDDEKSDRNRPWWRKRFVSAM PKAPIPFRKKEKQEKDKDDLGPDRFSTLTDDPSPRLSAQAQVA EDILDKYRNAIKRTSPSDGAMANYESTEVMGDGESAHDSPRDE ALQNISADDLPDSASQAAHPQDSAFSYRDAKKKLRLALCSADS VAFPVLT\HSTRNGLPDHTDPEDNEIVCFLKVQIAEAINLQDK NLMAQLQETMRCVCRFDNRTCRKLLASIAEDYRKRAPYIAYLT RCRQGLQTTQAHLERLLQRVLRDKEVANRYFTTVCVRLLLESK EKKIREFIQDFQKLTAADDKTAQVEDFLQFLYGAMAQDVIWQN ASEEQLQDAQLAIERSVMNRIFKLAFYPNQDGDILRDQVLHEH IQRLSKVVTANHRALQIPEVYLREAPWPSAQSEIRTISAYKTP RDKVQCILRMCSTIMNLLSLANEDSVPGADDFVPVLVFVLIKA NPPCLLSTVQYISSFYASCLSGEESYWWMQFTAAVEFIKTIDD RK
338	1077	536	1305	WPMSLARGHGDTAASTAAPLSEEGEVTSGLQALAVEDTGGPSA SAGKAEDEGEGGREETEREGSGGEEAQGEVPSAGGEEPAEEDS EDWCVPCSDEEVELPADGQPWMPPPSEIQRLYELLAAHGTLEL QAEILPRRPPTPEAQSEEERSDEEPEAKEEEEEKPHMPTEFDF DDEPVTPKDSLIDRRRTPGSSARSQKREARLDKVLSDMKRHKK LEEQILRTGRDLFSLDSEDPSPASPPLRSSGSSLFPRQRKY
339	1078	2	1771	LGRGTFGQVV*CWKRGTNEIVAIKILKNHPSYARQGQIEVSIL ARLSTESADDYNFVRAYECFQHKNHTCLVFEMLEQNLYDFLKQ NKFSPLPLKYIRPVLQQVATALMKLKSLGLIHADLKPENIMLV DPSRQPYRVKVIDFGSASHVSKAVCSTYLQSRYYRAPEIILGL PFCEAIDMWSLGCVIAELFLGWPLYPGASEYDQI/RYISQTQG LPAEYLLSAGTKTTRFFNRDTDSPYPLWRLKTPDDHEAETGIK SKEARKYIFNCLDDMAQVNMTTDLEGSDMLVEKAVRREFIDLL KKMLSIDSVKRFSPVGSLNHPFVTMSLFLDFPHSTHVKSCFQN MEICKRRVNMYDTVNQSKTPFITHVAPSTSTNLTMTFNNQLTT VHNQPSAASMAAVAQRSMPLQTGTAQICARPDPFQQALIVCPP GFQGLQASPSKHAGYSVRMENAVPIVTQAPGAQPLQIQPGLLA QQAWPSGTQQILLPPAWQQLTGVATHTSVQHAAVIPETMAGTQ QLADWRNTHAHGSHYNPIMQQPALLTGHVTLPAAQPLNVGVAH VMRQQPTSTTSSRKSKQHLYCGRARVSKIASR

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340	1079	2	2721	EFAICRYPLGMSGGQIPDEDITASSQWSESTAAKYGRLDSEEG DGAWCPEIPVEPDDLKEFLQIDLHTLHFITLVGTQGRHAGGHG IEFAPMYKINYSRDGTRWISWRNRHGKQVLDGNSNPYDIFLKD LEPPIVARFVRFIPVTDHSMNVCMRVELYGCVWLDGLVSYNAP AGQQFVLPGGSIIYLNDSVYDGAVGYSMTEGLGQLTDGVSGLD DFTQTHEYHVWPGYDYVGWRNESATNGYIEIMFEFDRIRNFTT MKVHCNNMFAKGVKIFKEVQCYFRSEASEWEPNAISFPLVLDD VNPSARFVTVPLHHRMASAIKCQYHFADTWMMFSEITFQSDAA MYNNSEALPTSPMAPTTYDPMLKVDDSNTRILIGCLVAIIFIL LAIIVIILWRQFWQKMLEKASRRMLDDEMTVSLSLPSDSSMFN NNRSSSPSEQGSNSTYDRIFPLRPDYQEPSRLIRKLPEFAPGE EESGCSGVVKPVQPSGPEGVPHYAEADIVNLQGVTGGNTYSVP AVTMDLLSGKRCGCGREFPPGKLLTFKEKLGEGQFGEVHLCEV EGMEKFKDKDFALDVSANQPVLVAVKMLRADANKNARNDFLKE IKIMSRLKDPNIIHLLSVCITDDPLCMITEYMENGDLNQFLSR HEPPNSSSSDVRTVSYTNLKFMATQIASGMKYLSSLNFVHRDL ATRNCLVGKNYTIKIADFGMSRNLYSGDYYRIQGRAVLPIRWM SWESILLGKFTTASDVWAFG\VTLWE\TFTFCQRKGPYS\QLS \DETGY*RNTGEFFPRPKGGQTYLPSTSPFVPDSCVIKLMLSC WRRDTKNRPSFQEIHLLLLQQGDERCCQCLAMFLRLRSSLQDL PLTHAYATPSGHLMKLRDRGLFALPSFPGHPHSLPLTHIYFFF FTLKN
341	1080	916	3	CSASPLRPGLLAPDLLYLPGAGQPRRPEAEPGQKPVVPTLYVT EAEAHSPALPGLSGPQPKWVEVEETIEVRVKKMGPQGVSPTTE VPRSSSGHLFTLPGATPGGDPNSNNSNNKLLAQEAWAQGTAMV GVREPLVFRVDARGSVDWAASGMGSLEEEGTMEEAGEEEGEDG DAFVTEESQDTHSLGDRDPKILTHNGRMLTLADLEDYVPGEGE TFHCGGPGPGAPDDPPCEVSVIQREIGEPTVG\SLCCSAWGMH WVPEALSASLGLSPMGR\HHRDPRSVALRAPPSSCGRPRLGLW AVLPG
342	1081	862	444	QGLAAEFLQVPAVTRAYTAACVLTTAAVQLELLSPFQLYFNPH LVFRKFQAPFLPWALMGFSLLLGNSILVDLLGIAVGHIYYFLE DVFPNQPGGKRLLQTPGFLGLQSSKAPAGSSLTIWTQQSQGGP GTAGELAAPS

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343	1082	3658	337	EKNALEPTVYFGMGV*APQVPRFQQRITGYQYYLQLRKDIWEE GIPCTLEQPIHLAGLAVQAIFGDFDQYESQDFLQKFALFPVGW LQDEKVLEEATQKVALLHQKYRGLTAPDAEMLYMQEVERMDGY GEESYPAKDSQGSDISIGACLEGIFVKHKNGRHPVVFRWHDIA NMSHNKSFFALELANKEETIQFQTEDMETAKYIWRLCVARHKF YRLNQCNLQTQTVTVNPIRRRSSSRMSLPKPQPYVMPPPP\QL HYNGHYTEPYASSQDNLFVPNQEG\YYGQFQTSLNRAQIDFNG RIR\NASVYSAHSTNSLNNPQPYLQPSPMSSNPSITGSDVMRP DYLPSHRHSAVIPPSYRPTPDYETVMKQLNRGLVHAERQSHSL RNLNIGSSYAYSRPAALVYSQPEIREHAQLPSPAAAHCPFSLS YSFHSPSPYPYPAERRPVVGAVSVPELTNAQLQAQDYPSPNIM RTQVYRPPPPYPPPRPANSTPDLSRHLYISSSNPDLITRRVHH SVQTFQEDSLPVAHSLQEVSEPLTAARHAQLHKRNSIEVAGLS HGLEGLRLKERTLSASAAEV\APRAVSVGSQP\SVFTERTQRE GPEEAEGLRYGHKKSLSDATMLIHSSEEEEDEDFEEESGARAP PARAREPRPGLAQDPPGCPRVLLAGPLHILEPKAHVPDAEKRM MDSSPVRTTAEAQRPWRDGLLMPSMSESDLTTSGRYRARRDSL KKRPVSDLLSGKKNIVEGLPPLGGMKKTRVDAKKIGPLKLAAL NGLSLSRVPLPDEGKEVATRATNDERCKILEQRLEQGMVFTEY ERILKKRLVDGECSTARLPENAERNRFQDVLPYDDVRVELVPT KENNTGYINASHIKVSVSGIEWDYIATQGPLQNTCQDFWQMVW EQGIAIIAMVTAEEEGGREKSFRYWPRLGSRHNTVTYGRFKIT TRFRTDSGCYATTGLKMKHLLTGQERTVWHLQYTDWPEHGCPE DLKGFLSYLEEIQSVRRHTNSTSDPQSPNPPLLVHCSAGVGRT GVVILSEIMIACLEHNEVLDIPRVLDMLR\QQRMMLVQTLCQY TFVYRVLIQVPEKAPRLILSSPQFPYGAQSCEAFTA
344	1083	6	304	RKKQKLAEE*VELSKLADLKDAEAVQKFFLEEI*L\GEEILAK GVDHLTNPSAVCGQPQWLLQVLQQTLPLPVIQMLLTKPLPVNQ RLVSAG/SLAKDDVE
345	1084	1255	635	SFCLHEFGWLGSSPQSDHPVPALLGLGAFVHHSLLQVHSSPGA GPVSFLFLGESCSPVDEPRCVPSCAFGFLSCFPLLNSAALERG LFFFVVFFFLESGSCQVARAGVRD/RDRGSLQPPPPGLKQFCL SLPSRWDHRHPPPLRVP*FVFVFLVELGFHHVAQAGLKLLTLS DPPAPASHSAGITGVSQRDQPVLFLRWASCSELVG
346	1085	116	415	EGFPGRSLSGGLCCRLRRRFPIDGYRPRRRRRWSCCPSGVRPV RRMSQKSWIESTLTKRECVYIIPSSKDPHRCLPGCQICQQLVR RGFTVLARMVSIS
347	1086	918	760	QNSTCLTAQTHSLLQHQPLQLTTLLDQYIREQREKDSVMSANG KPDPDTVPDS

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348	1087	1	750	LNPWKNALQDFCLPFLRITSLLQHHLFGEDLPSCQEEEEFSVL ASCLGLLPTFYQTEHPFISASCLDWPVPAFDIITHWCFEIKSF TERHAEQGKALLIQESKWKLPHLLQLPENYNTIFQYYHRKTCS VCTKVPKDPAVCLVCGTFVCLKGLCCKQQSYCECVLHSQNCGA GTGIFLLINASVIIIRGHRFCLWGSVYLDAHGEEDRDLRRGK PLYICKERYKVLEQQWISHTFDHINKRWGPHYNGL
349	1088	3	1374	KGQLVNLLPPENFPWCGGSQGPRMLRTCYVLCSQAGPRSRGWQ SLSFDGGAFHLKGTGELTRALLVLRLCAWPPLVTHGLLLQAWS RRLLGSRLSGAFLRASVYGQFVAGETAEEVKGCVQQLRTLSLR PLLAVPTEEEPDSAAKSGEAWYEGNLGAMLRCVDLSRGLLEPP SLAEASLMQLKVTALTSTRLCKELASWVRRPGASLELSPERLA EAMDSGQNLQVSCLNAEQNQHLRASLSRLHRVAQYARAQHVRL LVDAEYTSLNPALSLLVAALAVRWNSPGEGGPWVWNTYQACLK DTFERLGRDAEAAHRAGLAFGVKLVRGAYLDKERAVAQL\HG\ MEDPPTQADYEATS\QSYS\RCLELMLTHVARHGPMCHLMVAS HNEESVRQATK\GQAGYVVYKSIPYGSLEEVIPYLIRRAQENR SVLQGARREQELLSQKLWRRLLPGCRRIPH
350	1089	1036	306	VVEFGEMSTARAPEGLRWFQLYVHPDLQLNKQLIQRVESLGFK ALVITLDTPVCGNRRHDIRNQLRRNLTLTDLQSPKKGNAIPYF QMTPISTSLCWNDLSWFQSITRLPIILKGILTKEDAELAVKHN VQGIIVSNHGGRQLDEVLASIDALTEVGAAE*GNMKYYLDAGV RTGNDVQKALALGAKCIFLGRPILWGLACKGEHGVKEVLNILT NEFHTSMA\LTGCRSVAEINRNLVQFSRL
351	1090	1229	957	FFLRWSFTL\LPRLE/CQWLNLGSLQPPPPGFK*SSCLRLLSS WGLQVPTSMLG*FFCIFSREGISPCWPGWSQTPKVIHLPRPPR VLRLQA
352	1091	1145	365	LLCFVHTALQSFQGELYEPHVVIAIVVFLVKLGICK*RASWRK KVTLVVK*S/LKICFTKYGSCYHPGEKSSSWLFN*RMVNDCLA TSCSNRSFVIQQIPSSNLFMVVVDSSCLCESVAPITMAPIEIR YILLCAGPLTTTETSKGYQW*GNLGEKY*RRKITSFPLLERES S*ESCHCQILTSEMQSRKKQSLETCLNYSQHNESLKCERLKAQ KIRRRPESCHGFHPEENARECGGAPSLQAQTVLLLLPLLLMLF SR
353	1092	1140	790	VPSPTHDPKPAEAPMPA*PAPPGPASPGGALEPPAAARAGGSP TAVRSILTKERRPEGGYKAVWFGEDIGTEADVVVLNAPTLDVD GASDSGSGDEGEGAGRGGGPYDAPGGDDSYI

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354	1093	3	2293	LISLAGPTDDIQSTGPQVHALNILRALFRDTRLGENIIPYVAD GAKAAILGFTSPVWAVRNSSTLLFSALITRIFGVKRAKDEHSK TNRMTGREFFSRFPELYPFLLKQLETVANTVDSDMGEPNRHPS MFLLLLVLERLYASPMDGTSSALSMGPFVPFIMRCGHSPVYHS REMAARALVPFVMIDHIPNTIRTLLSTLPSCTDQCFRQNHIHG TLLQVFHLVQAYSDSKHGTNSDFQHELTDITVCTKAKLWLAKR QNPCLVTRAVYIDILFLLTCCLNRSAKDNQPVLESLGFWEEVR GIISGSELITGFPWAFKVPGLPQYLQSLTRLAIAAVWAAAAKS GERETNVPISFSQLLESAFPEVRSLTLEALLEKFLAAASGLGE KGVPPLLCNMGEKFLLLAMKENHPECFCKILKILHCMDPGEWL PQTEHCVHLTPKEFLIWTMDIASNERSEIQSVALRLASKVISH HMQTCVENRELIAAELKQWVQLVILSCEDHLPTESRLAVVEVL TSTTPLFLTNPHPILELQDTLALWKCVLTLLQSEEQAVRDAAT ETVTTAMSQENTCQSTEFAFCQVDASIALALALAVLCDLLQQW DQLAPGLPILLGWLLGESDDLVACVESMHQVEEDYLFEKAEVN FWAETLIFVKYLCKHLFCLLSKSGWRPPSPEMLCHLQRMVSEQ C\HLLSQFFRELPPAAEFVKTVEFTRLRIQEERTLACLRLLAF LEGKEGEDTLVLSVWDSYAESRQLTLPRTEAAC
355	1094	25	1265	HAFRPIALQRGVSFRGCSNQYAESRRLQGESGSRAFAHLMESL LQHLDRFSELLAVSSTTYVSTWDPATVRRALQWARYLRHIHRR FGRHGPIRTALERRLHNQWRQEGGFGRGPVPGLANFQALGHCD VLLSLRLLENRALGDAARYHLVQQLFPGPGVRDADEETLQESL ARLARRRSAVHMLRFNGYRENPNLQEDSLMKTQAELLLERLQE VGKAEAERPARFLSSLWERLPQNNFLKVIAVALLQPPLSRRPQ EELEPGIHKSPGEGSQVLVHWLLGNSEVFAAFCRALPAGLLTL VTSRHPALSPVYLGLLTDWGQRLHYDLQKGIWVGTESQDVPWE ELHNRFQSLCQAPPPLKDKVLTALETCKAQDGDFEEPGLSIWT DLLLALRSGAFRKRQVLGLSAGLSSV
356	1095	3	1027	SHLIQHQRIHT*E*AHECNECGKAFSQTSCLIQHHKMHRKEKS YECNEYEGSFSHSSDLILQQEVLTRQKAFDCDVWEKNSSQRAH LVQHQSIHTKE/K/PHECNEDGKIF/NQIQA/LIQHLRVHTRE K\YVCTACGKAFSHSSAIAQHQIIHTREKPSECDE*RKGISVK LLIDSC/RIYTSEKSYKCIECGKFFMLLVFSYLSHIWRIHMGI KFHCCNECEKAISQRNYLV*YQIHAMQKDYKCN/EACMCVRRF SHNPTLIQHQRIYT*ENLFGCSK/C/GRSFNRSLTSLCHIRIS I/RRQEFDVTQMEKLDTTFQA/STQHRNNGEKIVDYLFMKLLI HSPNLFHCTKI
357	1096	2638	2867	AVTLTAKICSFTPEPSETMSPPAGTNNSRHAALRAVTLPVKVC SFTPEPARSRTHQKEETPNTSEHQKEQTPEAPP

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358	1097	4747	4550	MAYSWQTDPNPNESHEKQYEHQEFLFVNQPHSSSQVSLGFDQI VDEISGKIPHYESEIDENTFFVPTAPKWDSTGHSLNEAHQISL NEFTSKSRELSWHQVSKAPAIGFSPSVLPKPQNTNKECSWGSP IGKHHGADDSRFSILAPSFTSLDKINLEKELENENHNYHIGFE *SSIPPTNSSFSSDFMPKEENKRSGHVNIVEPSLMLLKGSLQPG* MWESTWQKNIESIGCSIQLVEVPQSSNTSLASFCNKVKKIRER YHAADVNFNSGKIWSTTTAFPYQLFSKTKFNIHIFIDNSTQPL HFMPCANYLVKDLIAEILHFCTNDQLLPKDHILSVWGSEEFLQ NDHCLGSHKMFQKDKSVIQLHLQKSREAPGKLSRKHEEDHSQF YLNQLLEFMHIWKVSRQCLLTLIRKYDFHLKYLLKTQENVYNI IEEVKKICSVLGCVETKQITDAVNELSLILQRKGENFYQSSET SAKGLIEKVTTELSTSIYQLINVYCNSFYADFQPVNVPRCTSY LNPGLPSHLSFTVYAAHNIPETWVHRINFPLEIKSLPRESMLT VKLFGIACATNNANLLAWTCLPLFPKEKSILGSMLFSMTLQSE PPVEMITPGVWDVSQPSPVTLQIDFPATGWEYMKPDSEENRSN LEEPLKECIKHIARLSQKQTPLLLSEEKKRYLWFYRFYCNNEN CSLPLVLGSAPGWDERTVSEMHTILRRWTFSQPLEALGLLTSS FPDQEIRKVAVQQLDNLLNDELLEYLPQLVQAVKFEWNLESPL VQLLLHRSLQSIQVAHRLYWLLKNAENEAYFKSWYQKLLAALQ . FCAGKALNDEFSKEQKLIKILGDIGERVKSASDHQRQEVLKKE IGRLEEFFQDVNTCHLPLNPALCIKGIDHDACSYFTSNALPLK ITFINANLMGKNISIIFKAGDDLRQDMLVLQLIQVMDNIWLQE GLDMQMIIYRCLSTGKDQRLVQMVPDAVTLAKIHRHSGLIGPL KENTIKKWFSQHNHLKADYEKALRNFFYSCAGWCVVTFILGVC DRHNDNIMLTKSGHMFHIDFGKFLGHAQTFGGIKRDRAPFIFT SEM\EYFITEGG\KNPQHFQDFV\ELCCRAYNIIRKHSQLLL\ NLL\EMMLYAG\LPELSGI\QDLKYVYNNLRPQDTDLEATSHF TKKIKESLECFPVKLNNLIHTLAQMSAISPAKSTSQTFPQESC LLSTTRSIERATILGFSKKSSNLYLIQVTHSNNETSLTEKSFE QFSKLHSQLQKQFASLTLPEFPHWWHLPFTNSDHRRFRDLNHY MEQILNVSHEVTNSDCVLSFFLSEAGQQTVEESSPVYLGEKFP DKKPKVQLVISYEDVKLTILVKHMKNIHLPDGSAPSAHVEFYL LPYPSEVRRRKTKSVPKCTDPTYNEIVVYDEVTELQGHVLMLI VKSKTVFVGAINIRLCSVPLDKEKWYPLGNSII*PLLLFYTSN FMQSVLH
359	1098	679	346	FFLRWSLDSVTQAGVQSHDLSSLQPPPPGFKQSSLFGLPSSWE *RWVPPCPANFFVFLVETGFRHVGQAGLELLTSNDLPVSACQS AGITGVTTVPQRKSMILYEVTICYP

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360	1099	2	1601	FVREIRGPAVPRLTSAEDRHRHGPHAHSPELQRTGRDYSLDYL PFRLWVGIWVATFCLVLVATEASVLVRYFTRFTEEGFCALISL IFIYDAVGKMLNLTHTYPIQKPGSSAYGCLCQYPGPGGNESQW IRTRPKDRDDIVSMDLGLINASLLPPPECTRQGGHPRGPGCHT VPDIAFFSLLLFLTSFFFAMALKCVKTSRFFPSVVRKGLSDFS SVLAILLGCGLDAFLGLATPKLMVPREFKPTLPGRGWLVSPFG ANPWWWSVAAALPALLLSILIFMDQQITAVILNRMEYRLQKGA GFHLDLFWVAVLMLLTSALGLPWYVSATVISLAHMDSLRRESR ACAPGERPNFLGIREQRLTGLVVFILTGASIFLAPVLKFIPMP VLYGIFLYMGVAALSSIQFTNRVKLLL\MPAKHQPDLLLLRHV PLTRVHLFTAISFA\CLGLLW\IIKSTPAAIIFPLMLLGLVGV RKALERVFSPQELLWLDELMPEEERSIPEKGLEPEHSFSGSDS EDSELMYQPKAPEINISVN*LE*EFVREIRGPAVPRLTSAEDR HRHGPHAHSPELQRTGRDYSLDYLPFRLWVGIWVATFCLVLVA TEASVLVRYFTRFTEEGFCALISLIFIYDAVGKMLNLTHTYPI QKPGSSAYGCLCQYPGPGGNESQWIRTRPKDRDDIVSMDLGLI NASLLPPPECTRQGGHPRGPGCHTVPDIAFFSLLLFLTSFFFA MALKCVKTSRFFPSVVRKGLSDFSSVLAILLGCGLDAFLGLAT PKLMVPREFKPTLPGRGWLVSPFGANPWWWSVAAALPALLLSI LIFMDQQITAVILNRMEYRLQKGAGFHLDLFCVAVLMLLTSAL GLPWYVSATVISLAHMDSLRRESRACAPGERPNFLGIREQRLT GLVVFILTGASIFLAPVLKFIPMPVLYGIFLYMGVAALSSIQF TNRVKLLLDASKTPARPATLAACASDQGPPLHSHQLCPVWGCF GIIKSTPAAIIFPLMLLGLVGVRKALERVFSPQELLWLDELMP EEERSIPEKGLEPEHSFSGSDSEDSELMYQPKAPEINISVN

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361	1100	1	2636	MGLKARRAAGAAGGGGDGGGGGGGAANPAGGDAAAAGDEERKV GLAPGDVEQVTLALGAGADKDGTLLLEGGGRDEGQRRTPQGIG LLAKTPLSRPVKRNNAKYRRIQTLIYDALERPRGWALLYH\AL VFLIVLG\CLILAVL\TTFKEYETVSGDWLLLLETFAIFIFGA EFALRIWAAGCCCRYKGWRGRLKFARKPLCMLDIFVLIASVPV VAVGNQGNVLATSLRSLRFLQILRMLRDGPGEGGTWKLLG\SA ICAHSKELITAWYIGFLTLILSSFLVYLVEKDVPEVDAQGEEM KEEFETYADALWWGLITLATIGYGDKTPKTWEGRLIAATFSLI GVSFFALPAGILGSGLALKVQEQHRQKHFEKRRKPAAELIQAA WRYYATNPNRIDLVATWRFYESVVSFPFFRKEQLEAASSQKLG LLDRVRLSNPRGSNTKGKLFTPLNVDAIEESPSKEPKPVGLNN KERFRTAFRMKAYAFWQSSEDAGTGDPMAEDRGYGNDFPIEDM IPTLKAAIRAVRILQFRLYKKKFKETLRPYDVKDVIEQYSAGH LDMLSRIKYLQTRIDMIFTPGPPSTPKHKKSQKGSAFTFPSQQ SPRNEPYV\ARPST\SEI\EDQRH*WGKFVKSLKGQV\QGLGR KLDFLVDMHMQHMERLQVQVTEYYPTKGTSSPAEAEKKEDNRY SDLKTIICNYSETGPPEPPYSFHQVTIDKVSPYGFFAHDPVNL PRGGPSSGKVQATPPSSATTYVERPTVLPILTLLDSRVSCHSQ ADLQGPYSDRISPRQRRSITRDSDTPLSLMSVNHEELERSPSG FSISQDRDDYVFGPNGGSSWMREKRYLAEGETDTDTDPFTPSG SMP\LSSTGDGISDSVWTPSNKPI

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362	1101	1	5433	RTRGIIEFDPKYTAFEVEEDVGLIMIPVVRLHGTYGYVTADFISQSSSASPGG VDYILHGSTVTFQHGQNLSFINISIIDDNESEFEEPIEILLTGATGGAVLGRH LVSRIIIAKSDSPFGVIRFLNQSKISIANPNSTMILSLVLERTGGLLGEIQVN WETVGPNSQEALLPQNRDIADPVSGLFYFGEGEGGVRTIILTIYPHEEIEVEE TFIIKLHLVKGEAKLDSRAKDVTLTIQEFGDPNGVVQFAPETLSKKTYSEPLA LEGPLLITFFVRRVKGTFGEIMVYWELSSEFDITEDFLSTSGFFTIADGESEA SFDVHLLPDEVPEIEEDYVIQLVSVEGGAELDLEKSITWFSVYANDDPHGVFA LYSDRQSILIGQNLIRSIQINITRLAGTFGDVAVGLRISSDHKEQRIVTENAE RQLVVKDGATYKVDVVPIKNQVFLSLGSNFTLQLVTVMLVGGRFYGMPTILQE AKSAVLPVSEKAANSQVGFESTAFQLMNITAGTSHVMISRRGTYGALSVAWTT GYAPGLEIPEFIVVGNMTPTLGSLSFSHGEQRKGVFLWTFPSPGWPEAFVLHL SGVQSSAPGGAQLRSGFIVAEIEPMGVFQFSTSSRNIIVSEDTQMIRLHVQRL FGFHSDLIKVSYQTTAGSAKPLEDFEPVQNGELFFQKFQTEVDFEITIINDQL SEIEEFFYINLTSVEIRGLQKFDVNWSPRLNLDFSVAVITILDNDDLAGMDIS FPETTVAVAVDTTLIPVETESTTYLSTSKTTTILQPTNVVAIVTEATGVSAIP EKLVTLHGTPAVSEKPDVATVTANVSIHGTFSLGPSIVYIEEEMKNGTFNTAE VLIRRTGGFTGNVSITVKTFGERCAQMEPNALPFRGIYGISNLTWAVEEEDFE EQTLTLIFLDGERERKVSVQILDDDEPEGQEFFYVFLTNPQGGAQIVEGKDDT GFAAFAMVIITGSDLHNGIIGFSEESQSGLELREGAVMRRLHLIVTRQPNRAF EDVKVFWRVTLNKTVVVLQKDGVNLMEELQSVSGTTTCTMGQTKCFISIELKP EKVPQVEVYFFVELYEATAGAAINNSARFAQIKILESDESQSLVYFSVGSRLA VAHKKATLISLQVARDSGTGLMMSVNFSTQELRSAETIGRTIISPAISGKDFV ITEGTLVFEPGQRSTVLDVILTPETGSLNSFPKRFQIVLFDPKGGARIDKVYG TANITLVSDADSQAIWGLADQLHQPVNDDILNRVLHTISMKVATENTDEQLSA MMHLIEKITTEGKIQAFSVASRTLFYEILCSLINPKRKDTRGFSHFAELTENF AFSLLTNVTCGSPGEKSKTILDSCPYLSILALHWYPQQINGHKFEGKEGDYIR IPERLLDVQDAEIMAGKSTCKLVQFTEYSSQQWFISGNNLPTLKNKVLSLSVK GQSSQLLTNDNEVLYRIYAAEPRIIPQTSLCLLWNQAAASWLSDSQFCKVIEE TADYVECACLHMSVYAVYARTDNLSSYNEAFFTSGFICISGLCLAVLSHIFCA RYSMFAAKLLTHMMAASLGTQILFLASAYASPQLAEESCSAMAAVTHYLYLCQ FSWMLIQSVNFWYVLVMNDEHTERRYLLFFLLSWGLPAFVVILLIVILKGIYH QSMSQIYGLIHGDLCFIPNVYAALFTAALVPLTCLVVVFVVFIHAYQVKPQWK AYDDVFRGRTNAAEIPLILYLFALISVTWLWGGLHMAYRHFWMLVLFVIFNSL QLL\YPLFYFLLL*DQSSSASPGGVDYILHGSTVTFQHGQNLSFINISIIDDN ESEFEEPIEILLTGATGGAVLGRHLVSRIIIAKSDSPFGVIRFLNQSKISIAN PNSTMILSLVLERTGGLLGEIQVNWETVGPNSQEALLPQNRDIADPVSGLFYF GEGEGGVRTIILTIYPHEEIEVEETFIIKLHLVKGEAKLDSRAKDVTLTIQEF GDPNGVVQFAPETLSKKTYSEPLALEGPLLITFFVRRVKGTFGEIMVYWELSS EFDITEDFLSTSGFFTIADGESEASFDVHLLPDEVPEIEEDYVIQLVSVEGGA ELDLEKSITWFSVYANDDPHGVFALYSDRQSILIGQNLIRSIQINITRLAGTF GDVAVGLRISSDHKEQPIVTENAERQLVVKDGATYKVDVVPIKNQVFLSLGSN FTLQLVTVMLVGGRFYGMPTILQEAKSAVLPVSEKAANSQVGFESTAFQLMNI TAGTSHVMISRRGTYGALSVAWTTGYAPGLEIPEFIVVGNMTPTLGSLSFSHG EQRKGVFLWTFPSPGWPEAFVLHLSGVQSSAPGGAQLRSGFIVAEIEPMGVFQ FSTSSRNIIVSEDTQMIRLHVQRLFGFHSDLIKVSYQTTAGSAKPLEDFEPVQ NGELFFQKFQTEVDFEITIINDQLSEIEEFFYINLTSVEIRGLQKFDVNWSPR LNLDFSVAVITILDNDDLAGMDISFPETTVAVAVDTTLIPVETESTTYLSTSK TTTILQPTNVVAIVTEATGVSAIPEKLVTLHGTPAVSEKPDVATVTANVSIHG TFSLGPSIVYIEEEMKNGTFNTAEVLIRRTGGFTGNVSITVKTFGERCAQMEP NALPFRGIYGISNLTWAVEEEDFEEQTLTLIFLDGERERKVSVQILDDDEPEG QEFFYVFLTNPQGGAQIVEGKDDTGFAAFAMVIITGSDLHNGIIGFSEESQSG LELREGAVMRRLHLIVTRQPNRAFEDVKVFWRVTLNKTVVVLQKDGVNLMEEL QSVSGTTTCTMGQTKCFISIELKPEKVPQVEVYFFVELYEATAGAAINNSARF AQIKILESDESQSLVYFSVGSRLAVAHKKATLISLQVARDSGTGLMMSVNFST QELRSAETIGRTIISPAISGKDFVITEGTLVFEPGQRSTVLDVILTPETGSLN SFPKRFQIVLFDPKGGARIDKVYGTANITLVSDADSQAIWGLADQLHQPVNDD ILNRVLHTISMKVATENTDEQLSAMMHLIEKITTEGKIQAFSVASRTLFYEIL CSLINPKRKDTRGFSHFAELTENFAFSLLTNVTCGSPGEKSKTILDSCPYLSI LALHWYPQQINGHKFEGKEGDYIRIPERLLDVQDAEIMAGKSTCKLVQFTEYS SQQWFISGNNLPTLKNKVLSLSVKGQSSQLLTNDNEVLYRIYAAEPRIIPQTS LCLLWNQAAASWLSDSQFCKVIEETADYVECACLHMSVYAVYARTDNLSSYNE AFFTSGFICISGLCLAVLSHIFCARYSMFAAKLLTHMMAASLGTQILFLASAY ASPQLAEESCSAMAAVTHYLYLCQFSWMLIQSVNFWYVLVMNDEHTERRYLLF FLLSWGLPAFVVILLIVILKGIYHQSMSQIYGLIHGDLCFIPNVYAALFTAAL VPLTCLVVVFVVFIHAYQVKPQWKAYDDVFRGRTNAAEIPLILYLFALISVTW LWGGLHMAYRHFWMLVLFVIFNSLQLLVPSVLLFTSMRSTFFSFHTGTLTSRE KKSTFVLTCLLSPDSKGLGVLCFLNTEWAFQVH

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363	1102	2	2855	AAGATMERDGCAGGGSRGGEGGRAPREGPAGNGRDRGRSHAAE APGDPQAAASLLAPMDVGEEPLEKAARARTAKDPNTYKVLSLV LSVCVLTTILGCIFGLKPSCAKEVKSCKGRCFERTFG\NCRCD AACVELG\NCCLGLPGGTCI\EP\EHIW\TCNKFRCG\EKRLT RSLCACSDDCKD\RGDCLPSNLQFLCVQGE\KSWGRKNPCESH LMEP\QCP\AGFETPSLPLLIF/SLDGFRAEYLHTWGGLLPVI SKLKKCGTYTKNMRPVYPTKTFPNHYSIVTGLYPESHGIINNK MYDPKMNASFSLKSKEKFNPEWYKGEPIWVTAKYQGLKSGTFF WPGSDVEINGIFPDIYKMYNGSVPFEERILAVLQWLQLPKDER PHFYTLYLEEPDSSGHSYGPVSSEVIKALQRVDGMVGMLMDGL KELNLHRCLNLILISDHGMEQGSCKKYIYLNKYLGDVKNIKVI YGPAARLRPSDVPDKYYSFNYEGIARNLSCREPNQHFKPYLKH FLPKRLHFAKSDRIEPLTFYLDPQWQLALNPSERKYCGSGFHG SDNVFSNMQALFVGYGPGFKHGIEADTFENIEVYNLMCDLLNL TPAPNNGTHGSLNHLLKNPVYTPKHPKEVHPLVQCPFTRNPRD. NLGCSCNPSILPIEDFQTQFNLTVAEEKIIKHETLPYGRPRVL QKENTICLLSQHQFMSGYSQDILMPLWTSYTVDRNDSFSTEDF SNCLYQDFRIPLSPVHKCSFYKNNTKVSYGFLSPPQLNKNSSG IYSEALLTTNIVPMYQSFQVIWRYFHDTLLRKYAEERNGVNVV SGPVFDFDYDG\RCDSL\ENLRQKRRVHPVTQENFWIPNSTSF Y/VVLTSC\KDTSQTPLHC\ENL\DTLGFPFCLHRDWINSETC \VHG\KHDSSW\VEEFVKCLHRA\RITGC*GTSLGLSFYQQRK EPVSDILKLKTHLPTFSQED
364	1103	657	1	TVPPPPGGPSPAPLHPKRSPTSTGEAELKEERLPGRKASCSTA GSGSRGLPPL\SPMVSSAHNPNKAEIPERRKDSTSTPNNLPPS MMTRRNTYVCTERPGAERPSLLPNGKENSSGTPRVPPASPSSH SLAPPSGERSRLARGSTIRSTFHGGQVRDRRAGGWGWFFNKHA LQRAPRNAGAPSLMPGHRTVLINYGGGQDLKNWETCLAAPPNK HRR
365	1104	1	1313	HTLHHSSPTSEAEEFVSRLSTQNYFRSLPRGTSNMTYGTFNFL GGRLMIPNTGISLLIPPDAIPRGKIYEIYLTLHKPEDVRLPLA GCQTLLSPIVSCGPPG\VLLTRPVILG\MDHCG\EPSPDSW\S LRLKKQSCEGSWEDVLHLGEEAPSHLYYCQLEASACYVFTEQL SRYALVGEALSVAAAKRLKLLLFAPVACTSLEYNILVYCLHDT HDALNVVVQLEKQLQGQLIQEPLVLHFKDSYHNLRLSIHDVPS SLWKSKLLVSYQEIPFYHIWNGTQRYLHCTFTLERVSPSTSDL ACKLWVWQVEGDGQSFSINFNITKDTRFAELLALESEAGVPAL VGPSAFKIPFLIRQKIISSLDPPCRRGADWRTLAQKLHLDSHL. SFFASKPSPTAMILNLWEARHFPNGNLSQLAAAVAGTGPAGRW LLSQCSEAEC
366	1105	1	343	GSAAGQVQQQQQRRHQQGKVTVKYDRKELRKRLVLEEWIVEQL GQLYGCEEEEMPEVEIDIDDLFDAYSDEQRASKLQEALVDCYK PTEEFIKELLSRIRGMRKLSP\PQKKSV

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367	1106	2	1398	IMLDGRVRWLTPVISALWEAEMEDVIARMQDEKNGIPIRTVKS FLSKIPSVFSGSDIVQWLIKNLTIEDPVEALHLGTLMAAHGYF FPISDHVLTLKDDGTFYRFQTPYFWPSNCWEPENTDYAVYLCK RTMQNKARLELADYEAESLARLQRAFARKWEFIFMQAEAQAKV DKKRDKIERKILDSQERAFWDVHRPVPGCVNTTEVDIKKSSRM RNPHKTRKSVYGLQNDIRSHSPTHTPTPETKPPTEDELQQQIK YWQIQLDRHRLKMSKVADSLLSYTEQYLEYDPFLLPPDPSNPW LSDDTTFWELEASKEPSQQRVKRWGFGMDEALKDPVGREQFLK FLESEFSSENLRFWLAVEDLKKRPIKEVPSRVQEIWQEFLAPG APSAINLDSKSYDKTTQNVKEPGRYTFEDAQEHIYKLMKSDSY PRFIRSSAYQELLQAKK\KGKSLTSKRLTSLAQSY
368	1107	1	461	GTRDYPRIVNHLDHTYVTAPQAFMMFQYFVKVVPTVYMKVDGE VLTTNQIYVTRHEKAAYVLMGDQGLPGVFILYELSPMMVNLTE IHTFFSLFLTIVGA\TIGGMFFEHFVINYLTHKWGLGFYFKNE NSLQGGHRTLYGVNFFMYWSLRGGS
369	1108	2	1522	SVWWNSQRQFVVRAWGCAGPCGRAVFLAFGLGLGLIEEKQAES RRAVSACQEIQAIFTQKSKPGPDPLDTRRLQGFRLEEYLIGQS IGKGCSAAVYEATMPTLPQNLEVTKSTGLLPGRGPGTSAPGEG QERAPGAPAFPLAIKMMWNISAGSSSEAILNTMSQELVPASRV ALAGEYGAVTYRKSKRGPKQLAPHPNIIRVLRAFTSSVPLLPG ALVDYPDVLPSRLHPEGLGHGRTLFLVMKNYPCTLRQYLCVNT PSPRLAAMMLLQLLEGVDHLVQQGIAHRDLKSDNILVELDPDG CPWLVIADFGCCLADESIGLQLPFSSWYVDRGGNGCLMAPEVS TARPGPRAVIDYSKADAWAVGAIAYEIFGLVNPFYGQGKAHLE SRSYQEAQLPALPESVPPDVRQLVRALLQREASKRPSARVAAN VLHLSLWGEHILALKNLKLDKMVGWLLQQSAATLLANRLTEKC CVETKMKMLFLANLECETLCQAALLLCSWRAAL
370	1109	105	1252	RPLLRLAELPDHCYRMNSSPAGTPSPQPSRANGNINLGPSANP NAQPTDFDFLKVIGKGNYGKVLLAKRKSDGAFYAVKVLQKKSI LKKKEQSHIMAERSVLLKNVRHPFLVGLRYSFQTPEKLYFVLD YVNGGELFFHLQRERRFLEPRARFYAAEVASAIGYLHSLNIIY RDLKPENILLDCQGHVVLTDFGLCKEGVEPEDTTSTFCGTPEY LAPEVL\RKEPYDRAVDWWCLGAVLYEMLHGLPPFYSQDVSQM YENILHQPLQIPGGRTVAACDLLQSLLHKDQRQRLGSKADFLE IKNHVFFSPINWDDLYHKRLTPPFNPNVTGPADLKHFDPEFTQ EAVSKSIGCTPDTVASSSGASSAFLGFSYAPEDDDILDC

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371	1110	3	1608	RPQTLKGHQEKIRQRQSILPPPQGPAPIPFQHRGGDSPEAKNR VGPQVPLSEPGFRRRESQEEPRAVLAQKIEKETQILNCALDDI EWFVARLQKAAEAFKQLNQRKKGKKKGKKAPAEGVLTLRARPP \SEGEFIDCFQKIKLAINLLAKLQKHIQNPSAAELVHFLFGPL DLIVNTCSGPDIARSVSCPLLSRDAVDFLRGHLVPKEMSLWES LGESWMRPRSEWPREPQVPLYVPKFHSGWEPPVDVLQEAPWEV EGLASAPIEEVSPVSRQSIRNSQKHSPTSEPTPPGDALPPVSS PHTHRGYQPTPAMAKYVKILYDFTARNANELSVLKDEVLEVLE DGRQWWKLRSRSGQAGYVPCNILGEARPEDAGAPFEQAGQKYW GPASPTHKLPPSFPGNKDELMQHMDEVNDELIRKISNIRAQPQ RHFRVERSQPVSQPLTYESGPDEVRAWLEAKAFSPRIVENLGI LTGPQLFSLNKEELKKVCGEEGVRVYSQLTMQKAFLEKQQSGS ELEELMNKFHSMNQRRGEDS
372	1111	3	1046	AWHEGLVSSPAIGAYLSASYGDSLVVLVATVVALLDICFILVA VPESLPEKMRPVSWGAQISWKQADPFASLKKVGKDSTVLL\IC ITVCLSYLPEAG\QYSSFF\LYLR\QVIGFG\SVKIAAFIAMV GILSIVAQTAFLSILMRSLGNKNTVLLGLGFQMLQLAWYGFGS QAWMMWAAGTVAAMSSITFPAISALVSRNAESDQQGVAQGIIT GIRGLCNGLGPALYGFIFYMFHVELTELGPKLNSNNVPLQGAV IPGPPFLFGACIVLMSFLAALFIPEYSKASGVQKHSNSSSGSL TNTPERGSDEDIEPLLQDSSIWELSSFEEPGNQCTEL*TRQKV GFCIRHL
373	1112	1	1950	MAAGLATWLPFARAAAVGWLPLAQQPLPPAPGVKASRGDEVLV VNVSGRRFETWKNTLDRYPDTLLGSSEKEFFYDADSGEYFFDR DPDMFRHVLNFYRTGRLHCPRQECIQAFDEELAFYGLVPELVG DCCLEEYRDRKKENAERLAEDEEAEQAGDGPALPAGSSLRQRL WRAFENPHTSTAALVFYYVTGFFIAVSVIANVVETIPCRGSAR RSSREQPCGERFPQAFFCMDTACVLIFTGEYLLRLFAAPSRCR FLRSVMSLIDVVAILPYYIGLLVPKNDDVSGAFVTLRVFRVFR IFKFSRHSQGLRILGYTLKSCASELGFLLFSLTMAIIIFATVM FYAEKGTNKTNFTSIPAAFWYTIVTMTTLGYGDMVPSTIAGKI FGSICSLSGVLVIALPVPVIVSNFSRIYHQNQRADKRRAQQKV RLARIRLAKSGTTNAFLQYKQNGGLEDSGSGEEQAVCVRNRSA FEQQHHHLLHCLEKTTCHEFTDELTFSEALGAVSPGGRTSRST SVSSQPVGPGSLLSSCCPRRAKRRAIRLANSTASVSRG\SMQE LDMLAGL\RRSHAP\QSRSSL\NAKPHDSLDLNCDSG\DFVAA IISIPTPPANTPDESQPSSPGGGGRAGSTLRNSSLGTPCLFPE TVKISSL
374	1113	4	664	GWGKPFKDWTTGGQDTGGEPALLVGAGEGRAPRLNCPSGQIRS PGPGDLSIYDNWIRYFNRSSPVYGLVP/RSKTSARIYPTYHTA FDTFDYVDKFLDPGEEGDKGHPETRTGEAED*ALALSPCRR\F SSHQAVARTAGSVILRLSDSFFLPLKVSDYSETLRSFLQAAQQ DLGALLEQHSISLGPLVTAVEKFEAEAAALGQRISTLQKGSPD PLQVRML

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375	1114	1	1147	GIRGGGSLASGGPGPGHASLSQRLRLYLADSWNQCDLVALTCF LLGVGCRLTPGLYHLGRTVLCIDFMVFTVRLLHIFTVNKQLGP KIVIVSKMMKDVFFFLFFLGVWLVAYGVATEGLLRPRDSDFPS ILRRVFYRPYLQIFGQIPQEDMDVALMEHSNCSSEPGFWAHPP GAQAGTCVSQYANWLVVLLLVIFLLVANILLVNLLIAMFSYTF GKVQGNSDLYWKAQRYRLIREFHSRPALAPPFIVISHLRLLLR QLCRRPRSPQPSSPALEHFRVYLSKEAERKLLTWESVHKENFL LARARDKRESDSERLKRTSQKVDLALKQLGHIREYEQRLKVLE REVQQCSRVLGWVAEALSRSALLPPGGPPPPDLPGSKD
376	1115	3	329	LIKLCKSKAKSCENDLEMGMLNSKFKKTRYQAGMRNSENLTAN NTLSKPTRY/QGELKEIKQDISSLRYELLEEKSQATGELADLI QQLSEKFGKNLNKDHLRVNKGKDI
377	1116	1	2043	LPLLHAGFNRRFMENSSIIACYNELIQIEHGEVRSQFKLRACN SVFTALDHCHEAIEITSDDHVIQYVNPAFERMMGYHKGELLGK ELADLPKSDKNRADLLDTINTCIKKGKEWQGVYYARRKSGDSI QQHVKITPVIGQGGKIRHFVSLKKLCCTTDNNKQIHKIHRDSG DNSQTEPHSFRYKNRRKESIDVKSISSRGSDAPSLQNRRYPSM ARIHSMTIEAPITKVINIINAAQENSPVTVAEALDRVLEILRT TELYSPQLGTKDEDPHTSDLVGGLMTDGLRRLSGNEYVFTKNV HQSHSHLAMPITINDVPPCISQLLDNEESWDFNIFELEAITHK RPLVYLGLKVFSRFGVCEFLNCSETTLRAWFQVIEANYHSSNA YHNSTHAADVLHATAFFLGKERVKGSLDQLDEVAALIAATVHD VDHPGRTNSFL\CNAGSELAVLYNDT\AV\LESHHTALAFQ\L TVKDTK\CNIFKNID/RGNHYRTLRQAIIDMVLATEMTKHFEH VNKFVNSINKPMAAEIEGSDCECNPAGKNFPENQILIKRMMIK CADVANPCRPLDLCIEWAGRISEEYFAQTDEEKRQGLPVVMPV FDRNTCSIPKSQISFIDYFITDMFDAWDAFAHLPALMQHLADN YKHWKTLDDLKCKSLRLPSDRLKPSHRGGLLTDKGHCESQ

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378	1117	1	3585	AFLSKVEEDDYPSEELLEDENAINAKRSKEKNPGNQGRQFDVN LQVPDRAVLGTIHPDPEIEESKQETSMILDSEKTSETAAKGVN TGGREPNTMVEKERPLADKKAQRPFERSDFSDSIKIQTPELGE VFQNKDSDYLKNDNPEEHLKTSGLAGEPEGELSKEDHENTEKY MGTESQGSAAAEPEDDSFHWTPHTSVEPGHSDKREDLLIISSF FKEQQSLQRFQKYFNVHELEALLQEMSSKLKSAQQESLPYNME KVLDKVFRASESQILSIAEKMLDTRVAENRDLGMNENNIFEEA AVLDDIQDLIYFVRYKHSTAEETATLVMAPPLEEGLGGAMEEM QPLHEDNFSREKTAELNVQVPEEPTHLDQRVIGDTHASEVSQK PNTEKDLDPGPVTTEDTPMDAIDANKQPETAAEEPASVTPLEN AILLIYSFMFYLTKSLVATLPDDVQPGPDFYGLPWKPVFITAF LGIASFAIFLWRTVLVVKDRVYQVTEQQISEKLKTIMKENTEL VQKLSNYEQKIKESKKHVQETRKQNMILSDEAIKYKDKIKTLE KNQEILDDTAKNLRVMLESEREQNVKNQDLISENKKSIEKLKD VISMNASEFSEVQIALNEAKLSEEKVKSECHRVQEENARLKKK KEQLQQEIEDWSKLHAELSEQIKSFEKSQKDLEVALTHKDDNI NALTNCITQLNLLECESESEGQNKGGNDSDELANGEVGGDRNE KMKNQIKQMMDVSRTQTAISVVEEDLKLLQLKL\RASVSTKC\ NLEDQVKKLEDDRNSLQAAKAGLEDECKTLRQKVEILNELYQQ KEMALQKKLSQEEYERQEREHRLSAADEKAVSAAEEVKTYKRR IEEMEDELQKTERSFKNQIATHEKKAHENWLKARAAERAIAEE KREAANLRHKLLDLTQKMAMLQEEPVIVKPMPGKPNTQNPPRR GPLSQNGSFGPSPVSGGECSPPLTVEPPVRPLSATLNRRDMPR SEFGSLDGPLPHPRWSAEASGKPSPSDPGSGTATMMNSSSRGS SPTRVLDEGKVNMAPKGPPPFPGVPLMSTPMGGPVPPPIRYGP PPQLCGPFGPRPLPPPFGPGMRPPLGLREFAPGVPPGRRDLPL HPRGFLPGHAPFRPLGSLGPREYFIPGTRLPPPTHGPQEYPPP PAVRDLLPSGSRDEPPPASQSTSQDCSQALKQSP

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379	1118	3	2946	MAADSEPESEVFEITDFTTASEWERFISKVEEVLNDWKLIGNS LGKPLEKGIFTSGTWEEKSDEISFADFKFSVTHHYLVQESTDK EGKDELLEDVVPQSMQDLLGMNNDFPPRAHCLVRWYGLREFVV IAPAAHSDAVLSESKCNLLLSSVSIALGNTGCQVPLFVQIHHK WRRMYVGECQGPGVRTDFEMVHLRKVPNQYTHLSGLLDIFKSK IGCPLTPLPPVSIAIRFTYVLQDWQQYFWPQQPPDIDALVGGE VGGLEFGKLPFGACEDPISELHLATTW\PHLTEGIIVDNDVYS DLDPIQAPHWSVRVRKAENPQCLLGDFVTEFFKICRRKESTDE ILGRSAFEEEGKETADITHALSKLTEPASVPIHKLSVSNMVHT AKKKIRKHRGVEESPLNNDVLNTILLFLFPDAVSEKPLDGTTS TDNNNPPSESEDYNLYNQFKSAPSDSLTYKLALCLCMINFYHG GLKGVAHLWQEFVLEMRFRWENNFLIPGLASGPPDLRCCLLHQ KLQMLNCCIERKKARDEGKKTSASDVTNIYPGDAGKAGDQLVP DNLKETDKEKGEVGKSWDSWSDSEEEFFECLSDTEELKGNGQE SGKKGGPKEMANLRPEGRLYQHGKLTLLHNGEPLYIPVTQEPA PMTEDLLEEQSEVLAKLGTSAEGAHLRARMQSACLLSDMESFK AANPGCSLEDFVRWYSPRDYIEEEVIDEKGNVVLKGELSARMK IPSNMWVEAWETAKPIPARRQRRLFDDTREAEKVLHYLAIQKP ADLARHLLPCVIHAAVLKVKEEESLENISSVKKIIKQIISHSS KVLHFPNPEDKKLEEIIHQITNVEALIARARSLKAKFGTEKCE QEEEKEDLERFVSCLLEQPEVLVTGAGRGHAGRIIHKLFVNAQ RAAAMTPPEEELKRMGSPEERRQNSVSDFPPPAGREFILRTTV PRPAPYSKALPQRMYSVLTKEDFRLAGAFSSDTSFF
380	1119	2333	670	SPTRTGDRSVSLIVFLTEGKPTVGETHTLKILNNTREAARGQV CIFTIGIGNDVDFRLLEKLSLENCGLTRRVHEEEDAGSQLIGF YDEIRTPLLSDIRIDYPPSSVVQATKTLFPNYFNGSEIIIAGK LVDRKLDHLHVEVTASNSKKFIILKTDVPVRPQKAGKDVTGSP RPGGDGEGDTNHIERLWSYLTTKELLSSWLQSDDEPEKERLRQ RAQALAVSYRFLTPFTSMKLRGPVPRMDGLEEAHGMSAAMGPE PVVQSVRGAGTQPGPLLKKPYQPRIKISKTSVDGDPHFVVDFP LSRLTVCFNIDGQPGDILRLVSDHRDSGVTVNGELIGAPAPPN GHKKQRTYLRTITILINKPERSYLEITPSRVILDGGDRLVLPC NQSVVVGSWGLEVSVSANANVTVTIQGSIAFVILIHLYKKPAP FQRHHLGFYIANSEGLSSNCHGLLGQFLNQDARLTEDPAGPSQ NLTHPLLLQVGEGPEAVLTVKGHQVPVVWKQRKIYNGEEQIDC WFARNNAAKLIDGEYKDYLASHPFDTGMTLGQGMSREL
381	1120	102	426	VPLESLSCSHADNWKQELTKFISPDQLPVEFGGTMTDPDGNPK CLTKINYGGEVPKSYYLCKQVRLQYEHTRSVGRGSSLQVENEI LFPGCVLRCPEVLQHLQPGSF

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382	1121	3	3726	PAAPEHTDPSEPRGSVSCCSLLRGLSSGWSSPLLPAPVCNPNK AIFTVDAKTTEILVANDKACGLLGYSSQDLIGQKLTQFFLRSD SDVVEALSEEHMEADGHAAVVFGTVVDIISRSGEKIPVSVWMK RMRQERRLCCVVVLEPVERVSTWVAFQSDGTVTSCDSLFAHLH GYVSGEDVAGQHITDLIPSVQLPPSGQHIPKNLKIQRSVGRAR DGTTFPLSLKLKSQPSSEEATTGEAAPVSGYRASVWVFCTISG LITLLPDGTIHGINHSFALTLFGYGKTELLGKNITFLIPGFYS YMDLAYNSSLQLPDLASCLDVGNESGCGERTLDPWQGQDPAEG GQDPRINVVLAGGHVVPRDEIRKLMESQDIFTGTQTELIAGGQ LLSCLSPQPAPGVDNVPEGSLPVHGEQALPKDQQITALGREEP VAIESPGQDLLGESRSEPVDVKPFASCEDSEAPVPAEDGGSDA GMCGLCQKAQLERMGVSGPSGSDLWAGAAVAKPQAKGQLAGGS LLMHCPCYGSEWGLWWRSQDLAPSPSGMAGLSFGTPTLDEPWL GVENDREELQTCLIKEQLSQLSLAGALDVPHAELVPTECQAVT APVSSCDLGGRDLCGGCTGSSSACYALATDLPGGLEAVEAQEV DVNSFSWNLKELFFSDQTDQTSSNCSCATSELRETPSSLAVGS DPDVGSLQEQGSCVLDDRELLLLTGTCVDLGQGRRFRESCVGH DPTEPLEVCLVSSEHYAASDRESPGHVPSTLDAGPEDTCPSAE EPRLNVQVTSTPVIVMRGAAGLQREIQEGAYSGSCYHRDGLRL SIQFEVRRVELQGPTPLFCCWLVKDLLHSQRDSAARTRLFLAS LPGSTHSTAAELTGPSLVEVLRARPWFEEPPKAVELEGLAACE GEYSQKYSTMSPLGSGAFGFVWTAVDKEKNKEVVVKFIKKEKV LEDCWIEDPKLGKVTLEIAILSRVEHANIIKVLDIFENQGFFQ LVMEKHGSGLDLFAFIDRHPRLDEPLASYIFRQVRAG\QSRLV SAVGYLRLKDIIHRDIKDENIVIAEDFTIKLIDFGSAAYLERG KLFYTFCGTIEYCAPEVLMGNPYRGPELEMWSLGVTLYTLVFE ENPFCELEETVEAAIHPPYLVSKELMSLVSGLLQPVPERRTTL EKLVTDPWVTQPVNLADYTWEEVFRVNKPESGVLSAASLEMGN RSLSDVAQAQELCGGPVPGEAPNGQGCLHPGDPRLLTS
383	1122	177	1365	PGTSAATCRFLSPPVISLSFTGLCISDLVVAVNGVWILVETFM LKGGNFFSKHVPWSYLVFLTIYGVELFLKVAGLGPVEYLSSGW NLFDFSVTVFAFLGLLALALNMEPFYFIVVLRPLQLLRLFKLK ERYRNVLDTMFELLPRMASLGLTLLIFYYSFAIVGMEFFCGIV FPNCCNTSTVADAYRWRNHTVGNRTVVEEGYYYLNNFDNILNS FVTLFELTVVNNWYIIMEGVTSQTSHWSRLYFMTFYIVTMVVM TIIVAFILEAFVFRMNYSRKNQDSEVDGGITLEKEISKEELVA VLELYREARGASSDVTRLLETLSQMERYQQHSMVFLGRRSRTK SDLSLKMYQEEIQEWYEEHAREQEQQRQLSSSAAPAAQQPPGS RQRSQTVT

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384	1123	1	986	LAGVGTQAPPRRPGGEMAAGQNGHEEWVGSAYLFVESSLDKVV LSDAYAHPQQKVAVYRALQAALAESGGSPDVLQMLKIHRSDPQ LIVQLRFCGRQPCGRFLRAYREGALRAALQRSLAAALAQHSVP LQL\DLRAGAERLEALLADEERCLSCILAQQPDRLRDEELAEL EDALRNLKCGSGARGGDGEVASAPLQPPVPSLSEVKPPPPPPP AQTFLFQGQPVVNRPLSLKDQQTFARSVGLKWRKVGRSLQRGC RALRDPALDSLAYEYEREGLYEQAFQLLRRFVQAEGRRATLQR LVEALEENELTSLAEDLLGLTDPNGGLA
385	1124	2409	399	SSKPKLKKRFSLRSVGRSVRGSVRGILQWRGTVDPPSSAGPLE TSSGPPVLGGNSNSNSSGGAGTVGRGLVSDGTSPGERWTHRFE RLRLSRGGGALKDGAGMVQREELLSFMGAEEAAPDPAGVGRGG GVAGPPSGGGGQPQWQKCRLLLRSEGEGGGGSRLEFFVPPKAS RPRLSIPCSSITDVRTTTALEMPDRENTFVVKVEGPSEYIMET VDAQHVKAWVSDIQECLSPGPCPATSPRPMTLPLAPGTSFLTR ENTDSLELSCLNHSESLPSQDLLLGPSESNDRLSQGAYGGLSD RPSASISPSSASIAASHFDSMELLPPELPPRIPIEEGPPAGTV HPLSAPYPPLDTPETATGSFLFQG\EPEGGEGDQPLSGYPWFH GMLSRLKAAQLVLTGGTGSHGVFLVRQSETRRGEYVLTFNFQG KAKHLRLSLNEEGQCRVQHLWFQSIFDMLEHFRVHPIPLESGG SSDVVLVSYVPSSQRQQGEQSRSAGEEVPVHPRSEAGSRLGAM RGCAREMDATPNASCTLMPFGASDC\EPTTSHDPPQPPEPPSW TDPPQPGEE\EASR\APGSGGQQAAAAAKERQEKEKAGG\GGV PEE\LVPVV*LVPVGELGEGHRPQAQEAQGRLGPGGDAGVPP\ MVQLQQSPLGG\DGEEGGHPR\AI\NNQYSFV
386	1125	2204	1042	FRAPVGTAARSPQVVIRRLPPGLTKEQLEEQLRPLPAHDYFEF FAADLSLYPHLYSRAYINFRNPDDILLFRDRFDGYIFLDSKDP EYKKFLETYCVEEEKTSANPETLLGEMEAKTRELIARRTTPLL EYIKNRKLEKQRIREEKREERRRRELEKKRLREEEKRRRREEE RCKKKETDKQKKIAEKEVRIKLLKKPEKGEEPTTEKPKERGEE IDTGGGKQESCAPGAVVKARPMEGSLEEPQETSHSGSDKEHRD VERSQEQESEAQRYHVDDGRRHRAHHEPERLSRRSEDEQRWGK GPGQDRGKKGSQDSGAPGEAMERLGRAQRCDDSPAPRKERLAN KDRPALQLYDPGARFRARECGGNRRICKAEGSGTGPEKREEAE
387	1126	176	800	GVWGVCVSGLLQVGSQRAQAWRAWSPMETPLTGTFLWPHIPQG LFFDDSYGFYPGQVLIGPAKIFSSVQWLSGVKPVLSTKSKFRV VVEEVQVVELKVTWITKSFCPGGTDSVSPP/PSVITQENLGRV KRLGCFDHAQR/HAWGALSVCLPSQGRASQDCLGMSRKKLRPG GGLYGQEGEAPVEEAGCADHVMLPRHPVFPGPFHGRPR

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388	1127	1	2017	FRDSSPCSAFEFHCLSGECIHSSWRCDGGPDCKDKSDEENCAV ATCRPDEFQCSDGNCIHGSRQCDREYDCKDMSDEVGCVNVTLC EGPNKFKCHSGECITLDKVCNMARDCRDWSDEPIKECGTNECL DNNGGCSHVCNDLKIGYECLCPDGFQLVAQRRCEDIDECQDPD TCSQLCVNLEGGYKCQCEEGFQLDPHTKACKAVGSIAYLFFTN RHEVRKMTLDRSEYTSLIPNLRNVVALDTEVASNRIYWSDLSQ RMICSTQLDRAHGVSSYDTVISRDIQAPDGLAVDWIHSNIYWT DSVLGTVSVADTKGVKRKTLFRENGSKPRAIVVDPVHGFMYWT DWGTPAKIKKGGLNGVDIYSLVTENIQWPNGITLDLLSGRLYW VDSKLHSISSIDVNGGNRKTILEDEKRLAHPFSLAVFEDKVFW TDIINEAIFSANRLTGSDVNLLAENLLSPEDMVLFHNLTQPRG VNWCERTTLSNGGCQYLCLPAPQINPHSPKFTCACPDGMLLAR DMRSCLTEG\EAAVATQETSTVRLKVSSTAVRTQHTTTRPVPD TSRLPGATPGLTTVEIVTMSHQALGDVAG\RGN\EKKPSSVRA LSIVLPIV\LLVFLCLGVFLLWKNWRLKNINSINFDNPVYQKT TEDEVHICHNQDGYSYPSRQMVSLEDDVA
389	1128	2299	1148	RIPGLGPPGSPPPPPHVRGMPGCPCPGCGMAGPRLLFLTALAL ELLGRAGGSQPALRSRGTATACRLDNKESESWGALLSGERLDT WICSLLGSLMVGLSGVFPLLVIPLEMGTMLRSEAGAWRLKQLL SFALGGLLGNVFLHLLPEAWAYTCSASPGGEGQSLQQQQQLGL WVIAGILTFLALEKMFLDSKEEGTSQAPNKDPTAAAAALNGGH CLAQPAAEPGLGAVVRSIKVSGYLNLLANTIDNFTHGLAVAAS FLVSKKIGLLTTMAILLHEIPHEVGDFAILLRAGFDRWSAAKL QLSTALGGLLGAGFAICTQSPKGVEETAAWVLPFTSGGFLYIA LVNVLPDLLEEEDPWRSLQQLLLLCAGIVVMVLFSLFVD
390	1129	1	523	GKVSAGQAGADRTLRRAPEPRFSQEPTGNSAYPQLRPFLDPQG RDLKPSALVPPTRSHTGRRPWLHTQPLPGPQGRAWGPTC/TPA CVDRVLESEEGRREYLAFPTSKSSGQKGRKELLKGNGRRIDYM LHAEEGLCPDWKAEVEEFSFITQLSGLTDHLPVAMRLMVSSGE EEA
391	1130	1459	765	PCGGIRLSASEAATLFGYLVVPAGGGGTFLGGFFVNKLRLRGS AVIKFCLFCTVVSLLGILVFSLHCPSVPMAGVTASYGGSLLPE GHLNLTAPCNAACSCQPEHYSPVCGSDGLMYFSLCHAGCPAAT ETNVDGQKVSGAAAYRPCPPLDPGKGPPCLPLVIGAIVGLPRC TETVAVSLRIFPLVLAM\HCREMHFNLSEKAPPSGFHIRCNFL YIPQQHSCTNGNSTMCP
392	1131	1668	962	LLRKVGAPGGARGVIRLLDWFERPDGFLLVLERPEPA\QD\LF DFITERGALDEPLARRF\FAQVLAAVRHCHSCGVVHRDIKDEN LLVDLRSGELKLIDFGSGALLKDTVYTDFDGTRVYSPPEWIRY HRYHGRSATVWSLGVLLYDMVCGDIPFEQDEEILRGRLLFRRR VSPECQQLIRWCLSLRPSERPSLDQIAAHPWMLGADGGAPESC DLRLCTLDPDDVASTTSSSESL

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393	1132	3	817	GKNSQKASPVDDEQLSVCLSGFLDEVMKKYGSLVPLSEKEVLG RLKDVFNEDFSNRKPFINREITNYRARHQKCNFRIFYNKHMLD MDDLATLDGQNWLNDQVINMYGELIMDAVPDKVHFFNSFFHRQ LVTKGYNGVKRWTKKVDLFKKSLLLIPIHLEVHWSLITVTLSN RIISFYDSQGIHFKFCVENIRKYLLTEAREKNR\LNLQGWQTA VTKCIPQQKNDSDCGVFVLQYCKCLAL\KQPFQFSQEDMPRVR KRIYKELCECRLMD
394	1133	1252	628	PPGG*QGSAAKHR/FP/KGYRHPALEARLGRRRTVQEARALLR CRRAGISAPVVFFVDYASNCLYMEEIEGSVTVRDYIQSTMETE K\TPQGLSNLAKTIGQVLARMHDEDLIHGDLTTSNMLLKPPLE QLNIVLIDFGLSFISALPEDKGVDLYVLEKAFLSTHPNTETVF EAFLKSYSTSSKKARPVLKKLDEVRLRGKKRSMVG
395	1134	2	1595	RACVFRPEDMMQGEAHPSASLIDRTIKMRKETEARKVVLAWGL LNVSMAGMIYTEMTGKLISSYYNVTYWPLWYIELALASLFSLN ALFDFWRYFKYTVAPTSLVVSPGQQTLLGLKTAVVQTTPPHDL AATQIPPAPPSPSIQGQSVLSYSPSRSPSTSPKFTTSCMTGYS PQLQGLSSGGSGSYSPGVTYSPVSGYNKLASFSPSPPSPYPTT VGPVESSGLRSRYRSSPTVYNSPTDKEDYMTDLRTLDTFLRSE EEKQHRVKLGSPDSTSPSSSPTFWNYSRSMGDYAQTLKKFQYQ LACRSQAPCANKDEADLSSKQAAEEVWARVAMNRQLLDHMDSW TAKFRNWINETILVPLVQEIESVSTQMRRMGCPELQIGEASIT SLKQAALVKAPLIPTLNTIVQYLDLTPNQEYLFERIKELSQGG CMSSFRWNRGGDFKGRKWDTDLPTDSAIIMHVFCTYLDSRLPP HPKYPDGKTFTSQHFVQTPNKPDVTNENVFCIYQSAINPPHYE LIYQRHVYIPAKGQK
396	1135	16	1542	SSAVEFINRNNSVVQVLLAAGADPNLGDDFSSVYKTAKEQGIH SLEVLITREDDFNNRLNNRASFKGCTALHYAVLADDYRTVKEL LDGGANPLQRNEMGHTPLDYAREGEVMKLLRTSEAKYQEKQRK REAEERRRFPLEQRLKEHIIGQESAIATVGAAIRRKENGWYDE EHPLVFLFLGSSGIGKTELAKQTAKYMHKDAKKGFIRLDMSEF QERHEVAKFIGSPPGYVGHEEGGQLTKKLKQCPNAVVLFDEVD KAHPDVLTIMLQLFDEGRLTDGKGKTIDCKDAIFIMTSNVASD EIAQHALQLRQEALEMSRNRIAENLGDVQISDKITISKNFKEN VIRPILKAHFRRDEFLGRINEIVYFLPFCHSELIQLVNKELNF WAKRAKQRHNITLLWDREVADVLVDGYNVHYGARSIKHEVERR VGNQLAAAYEQDLLP\GGCTLRITVEDSDKQLLKSPELPSPQA EKRLPKLRLEIIDKDSKTRRLDIRAPLHPEKVCNTI
397	1136	1848	1602	SSCDRERHGSLGMMSGSFILCLALVTRWSPQASSVPLAVYESK TRKSYRSQRDRDGKDRSQGMGLSLLVETRKLLLSANQG

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398	1137	1497	717	HTPMA/FFL/SFLSTSET/VYTFVILPKMLINLLSVARTISFN CCALQMFFFLGFAITNCLLLGVMGYDRYAAICHPLHYPTLMSW QVCGKLAAACAIGGFLASLTVVNLVFSLPFCSTNKVNHYFCDI SAVILLACTNTDVNGFVIFICGVLVLVVPFLFICVSYFCILRT ILKIPSAEGRRKAFSTCASHLSVVIVHYGCASFIYLRPTANYV SNKDRLVTVTYTIVTPLLNPMVYSLRNKDVQLAIRKVLGKKGS LKLYN
399	1138	2	1185	RPPAATRYPREKLKSMTSRDNYKAGSREAA\AAAAAAVAAAAA AAAAAEPYPVSGAKRKYLEDSDPERSDYEEQQLQEEEEARKVK SGIRQMRLFSQDECAKIEARIDEVVSRAEKGLYNEHTVDRAPL RNKYFFGEGYTYGAQLQKRGPGQERLYPPGDVDEIPEWVHQLV IQKLVEHRVIPEGFVNSAVINDYQPGGCIVSHVDPIHIFERPI VSVSFFSDSALCFGCKFQFKPIRVSEPVLSLPVRRGSVTVLSG YAADEITHCIRPQDIKERRAVIILRKTRLDAPRLETKSLSSSV LPPSYASDRLSGNNRDPALKPKRSHRKADPDAAHRPRILEMDK EENRRSVLLPTHRRRGSFSSENYWRKSYESSEDCSEAAGSPAR KVKMRRH
400	1139	60	1699	VTWHFYFCSDHKNGHYIIPQMADRSRQKCMSQSLDLSELAKAA KKKLQALSNRLFEELAMDVYDEVDRRENDAVWLATQNHSTLVT ERSAVPFLPVNPEYSATRNQGRQKLARFNAREFATLIIDILSE AKRRQQGKSLSSPTDNLELSLRSQSDLDDQHDYDSVASDEDTD QEPLRSTGATRSNRARSMDSSDLSDGAVT\LQEYLELKKALAT SEAKVQQLMKVNSSLSDEL\RRLQREHFAPI\IHKLQAENLQL RQPPGPVPTPPLPSERAEHTPMAPGGSTHRRDRQAFSMYEPGS ALKPFGGPPGDELTTRLQPFHSTELEDDAIYSVHVPAGLYRIR KGVSASAVPFTPSSPLLSCSQEGSRHTSKLSRHGSGADSDYEN TQSGDPLLGLEGKRFLELGKEEDFHPELESLDGDLDPGLPSTE DVILKTEQVTKNIQELLRAAQEFKHDSFVPCSEKIHLAVTEMA SLFPKRPALEPVRSSLRLLNASAYRLQSECRKTVPPEPGAPVD FQLLTQQVIQCAYDIAKAAKQLVTITTREKKQ

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401	1140	1	1863	RYLSYGSGPKRFPLVDVLQYALEFASSKPVCTSPVDDIDASSP PSGSIPSQTLPSTTEQQGALSSELPSTSPSSVAAISSRSVIHK PFTQSRIPPDLPMHPAPRHITEEELSVLESCLHRWRTEIENDT RDLQESISRIHRTIELMYSDKSMIQVPYRLHAVLVHEGQANAG HYWAYIFDHRESRWMKYNDIAVTKSSWEELVRDSFGGYRNASA YCLMYINDKAQFLIQEEFN/K/ETGQPLVGIETLPPDLRDFVE EDNQRFEKELEEWDAQLAQKALQEKLLASQKLRESETSVTTAQ AAGDPKYLEQPSRSDFSKHLKEETIQIITKASHEHEDKSPETV LQSAIKLEYARLVKLAQEDTPPETDYRLHHVVVYFIQNQAPKK IIEKTLLEQFGDRNLSFDERCHNIMKVAQAKLEMIKPEEVNLE EYEEWHQDYRKFRETTMYLIIGLENFQRESYIDSLLFLICAYQ NNKELLSKGLYRGHDEELISHYRRECLLKLNEQAAELFESGED REVNNGLIIMNEFIVPFLPLLLVDEMEEKDILAVEDMRNRWCS YLGQEMEPHLQEKLTDFLPKLLDCSMEIKSFHEPPKLPSYSTH ELCERFARIMLSLSRTPADGR
402	1141	1	465	AQVYVRMDSFDEDLARPSGLLAQERKLCRDLVHSNKKEQEFRS IFQHIQSAQSQRSPSELFAQHM\VPIVHHVKEHHFGSSGMTLH ERFT\KYLKRG\TEQEAAKNKKSPEIHRRIDISPSTFRKHGLA HDEMKSPREPGYKDGHNSKNELQRVNFY
403	1142	2	369	TYTFCFSLMI\ILLTIIQGLILEAFGELRDQLDQVKEDMETKC FICGIGNDYFDTVPHGFETHTLQEHNLANYLFFLMYLINKDET EHTGQESYVWKMYQERCWEFFPAGDCFRKQYEDQLN
404	1143	3115	557	FRRKGGGGPKDFGAGLKYNSRHEKVNGLEEGVEFLPVNNVKKV EKHGPGRWVVLAAVLIGLLLVLLGIGFLVWHLQYRDVRVQKVF NGYMRITNENFVDAYENSNSTEFVSLASKVKDALKLLYSGVPF LGPYHKESAVTAFSEGSVIAYYWSEFSIPQHLVEEAERVMAEE RVVMLPPRARSLKSFVVTSVVAFPTDSKTVQRTQDNSCSFGLH ARGVELMRFTTPGFPDSPYPAHARCQWALRGDADSVLSLTFRS FDLASCDERGRHLV\TVYNT\LSPMEPHA\LVQLCGTYPPSYN LTFHS\S\QNVLLITLITNTERRHPG\FEATFFQLPRMSSCGG RLRKAQGTFNSPYYPGHYPPNIDCTWNIEVPNNQHVKVRFKFF YLLEPGVPAGTCPKDYVEINGEKYCGERSQFVVTSNSNKITVR FHSDQSYTDTGFLAEYLSYDSSDPCPGQFTCRTGRCIRKELRC DGWADCTDHSDELNCSCDAGHQFTCKNKFCKPLFWVCDSLNDC GDNSDEQGCSCP\AQTFRCSNGKCLSKSQQCNGKDDCGDGSDE ASCPKVNVVTCTKHTYRCLNGLCLSKGNPECDGKEDCSDGSDE KDCDCGLRSFTRQARVVGGTDADEGEWPWQVSLHALGQGHICG ASLISPNWLVSAAHCYIDDRGFRYSDPTQWTAFLGLHDQSQRS APGVQERRLKRIISHPFFNDFTFDYDIALLELEKPAEYSSMVR PICLPDASHVFPAGKAIWVTGWGHTQYGGTGALILQKGEIRVI NQTTCENLLPQQITPRMMCVGFLSGGVDSCQGDSGGPLSSVEA DGRIFQAGVVSWGDGCAQRNKPGVYTRLPLFRDWIKENTGV

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405	1144	1	424	RHEEDLGNLWENTRFTDCSFFVRGQEFKAHKSVLAARSPVFNA MFEHEMEESKKNRVEINDLDPEVFKEMMRFIYTGRAPNLDKMA DNLLAAADKYALERLKVMCEKALCSNLSVENVADTLVLADLHS \AEQLKAQAIDFINRCSVLRQLGCKDGKNWNSNQATDIMETSG GKSMIQSHPHLVAEAFRALASAQGPQFGIPRKRLKQS*NLGNL WENTRFTDCSFFVRGQEFKAHKSVLAARSPVFNAMFEHEMEES KKNRVEINDLDPEVFKEMMRFIYTGRAPNLDKMADNLLAAADK YALERLKVMCEKALCSNLSVENVADTLVLADLHSGRTVESTSH RLY
406	1145	1	1021	QRGGIPGKFQEDSGSVDWALGPFWGIFQADFGCMRFYLSAQTS DPVLRM*WGPSPISHPTSLCPGGGGAGQTTGSLCLGQQCCPLS CPNIPSRHKRWRL*AALVAGSRGSCTLRS*R*RTPLPVTRNLP R/CHLHLHPTGDLRVHVHQHCLLHGHVPPGAALLQCGGCDLRG EAAGLLFLGHACLRGSVNLRRDQWLPV\PYSRLCFSGAREGHL PSLLAMIHVRHCTPIPALLVC\PIKVNLLIPVAYLVFWAFLLV FSFISEHMVCGVGVIIILTGVPIFFLGVFWRSKPKCVHRLTES MTHWGQELCFVVYPQDAPEEEENGPCPPSLLPATDKPSKPQ
407	1146	2	1280	AAALVAEYLALLEDHRHLPVGCVSFQNISSNVLEESAISDDIL SPDEEGFCSGKHFTELGLVGLLEQAAGYFTMGGLYEAVNEVYK NLIPILEAHRDYKKLAAVHGKLQEAFTKIMHQSSGWERVFGTY FRVGFYGAHFGDLDEQEFVYKEPSITKLAEISHRLEEFYTERF GDDVVEIIKDSNPVDKSKLDSQKAYIQITYVEPYFDTYELKDR VTYFDRNYGLRTFLFCTPFTPDGRAHGELPEQHKRKTLLSTDH AFPYIKTRIRVCHREETVLTP\VEVAIEDMQKKTRELAFATEQ DPPDAKMLQMVLQGSVGPTVNQGPLEVAQVFLAEIPEDPKLFR HHNKLRLCFKDF*KKCEDALRKNKALIGPDQKEYHRELERNY CRLREALQPLLTQRLPQLMAPTPPGLRNSLNRASFRKADL
408	1147	55	651	GEGQQWQSTPLSPLQPTVADFLNLAWWTSAAAW*VLSGRWVEK VLPGREGSEEK*GMASSSADHLHSAPRALQ\SLFQQLLYGLIY HSWFQAGR*GFGGASSSPGPQSELRRLHGEGGVYD*GRPETLP GSVGGAEALWALADPAEAEGSPETRESSCVMKQTQYYFGSVNA SYNAIIDCGNCSRCWQWGGTRGQGRNL
409	1148	1855	904	VAGIPACFDN/FTEALAETACRQMGYSSKPTFRAVEIGPDQDL DVVEITENSQELRMRNSSGPCLSGSLVSLHCLACGESLKTPRV VGGEEASVDSWPWQVSIQYDKQHVCGGSILDPHWVLTAAHCFR KHTDVFNWKVRAGSDKLGSFPSLAVAKIIIIEFNPMYPKDNDI ALMKLQFPLTFSGTVRPICLPFFDEELTPATPLWIIGWGFTKQ NGGKMSDILLQASVQVIDSTRCNADDAYQGEVTEKMMCAGIPE GGVDTCQGDSGGPLMYQSDQWHVVGIVSWGYGCGGPSTPGVYT KVSAYLNWIYNVWKAEL

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410	1149	3	964	TISTVRWNSRIGMVLGVAIQKRAV\PGLY\AFEEAYARADKEA PRPCHKGSWCSSNQLCRECQAFMAHTMPKLKAFSMSSAYNAYR AVYAVAHGLHQLLGCASGACSRGRVYPWQLLEQIHKVHFLLHK DTVAFNDNRDPLSSYNIIAWDWNGPKWTFTVLGSSTWSPVQLN INETKIQWHGKDNQVPKSVCSSDCLEGHQRVVTGFHHCCFECV PCGAGTFLNKS/SYLGKDLPENYNEAKCVTFSLLFNFVSWIAF FTTASVYDGKYLPAANMMAGLSSLSSGFGGYFLPKCYVILCRP DLNSTEHFQASIQDYTRRCGST
411	1150	2	1378	VARGAFHPKMGPSFPSPKPGSERLSFVSAKQSTGQDTEAELQD ATLALHGLTVEDEGNYTCEFATFPKGSVRGMTWLRVIAKPKNQ AEAQKVTFSQDPTTVALCISKEGRPPARISWLSSLDWEAKETQ VSGTLAGTVTVTSRFTLVPSGRADGVTVTCKVEHESFEEPALI PVTLSVRYPPEVSISGYDDNWYLGRTDATLSCDVRSNPEPTGY DWSTTSGTFPTSAVAQGSQLVIHAVDSLFNTTFVCTVTNAVGM GRAEQVIFVRETPNTAGAGATGGIIGGIIAAIIATADA\TGIL ICRQQRKEQTLQGAEEDEDLEGPPSYKPPTPKAKLEAQEMPSQ LFTLGASEHSPLKTPYFDAGASCTEQEMPRYHELPTLEERSGP LHPGATSLGSPIPVPPGPPAVEDVSLDLEDEEGEEEEEYLDKI NPIYDALSYSSPSDSYQGKGFVMSRAMYV
412	1151	1	1828	GTRLREDKNHNMYVAGCTEVEVKSTEEAFEVFWRGQKKRRIAN THLNRESSRSHSVFNIKLVQAPLDADGDNVLQEKEQITISQLS LVDLAGSERTNRTRAEGNRLREAGNINQSLMTLRTCMDVLREN QMYGTNKMVPYRDSKLTHLFKNYFDGEGKVRMIVCVNPKAEDY EENLQVMRFAEVTQEVEVARPVDKAICGLTPGRRYRNQPRGP\ IGNEPLVTDVVLQSFPPLPSCEILDINDEQTLPRLIEALEKRH NLRQMMIDEFNKQSNAFKALLQEFDNAVLSKENHMQGKLNEKE KMISGQKLEIERLEKKNKTLEYKIEILEKTTTIYEEDKRNLQQ ELETQNQKLQRQFSDKRRLEARLQGMVTETTMKWEKECERRVA AKQLEMQNKLWVKDEKLKQLKAIVTEPKTEKPERPSRERDREK VTQRSVSPSPVPLLFQPDQNAPPIRLRHRRSRSAGDRWVDHKP ASNMQTETVMQPHVPHAITVSVANEKALAKCEKYMLTHQELAS DGEIETKLIKGDIYKTRGGGQSVQFTDIETLKQESPNGSRKRR SSTVAPAQPDGAESEWTDVETRCSVAVEMRAGSQLGPGYQHHA QPKRKKP
413	1152	1	336	PFSSSSVSSKGSDPFGTLDPFGSGSFNSAEGFADFSQMS/KGK STPVSQLGSADFPEAPDPFQPLGADSGDPFQSKKGFGDPFSGK DPFVPSSAAKPSKASASGFADFTSVS

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414	1153	1	1334	MSLMVVSMACVGLFLVQRAGPHMGGQDKPFLSAWPSAVVPRGG HVTLRCHYRHRFNNFMLYKEDRIHIPIFHGRIFQESFNMSPVT TAHAGNYTCRGSHPHSPTGWSAPSNPVVIMVTGNHRKPSLLAH PGPLVKSGERVILQCWSDIMFEHFFLHKEGISKDPSRLVGQIH DGVSKANFSIGPMMQDLAGTYRCYGSVTHSPYQLSAPSDPLDI VITGLYEKPSLSAQPGPTVLAGESVTLSCSSRSSYDMYHLSRE GEAHERRFSAGPKVNGTFQADFPLGPATHGGTYRCFGSFRDSP YEWSNSSDPLLVSVTGNPSNSWPSPTEPSSETGNPRHLHVLIG TSVVIILFILLLFFLLHRWCSN\KKNAAVMDQESAGNRTANSE DSDEQDPQEVTYTQLNHCVFTQRKITRPSQRPKTPPTDIIVYT ELPNAESRSKVVSCP
415	1154	1	1570	MSLRVHTLPTLLGAVVRPGCRELLCLLMITVTVGPGASGVCPT ACICATDIVSCTNKNLSKVPGNLFRLIKRLDLSYNRIGLLDSE WIPVSFAKLNTLILRHNNITSISTGSFSTTPNLKCLDLSSNKL KT\VKNAVFQELKVLEVLLLYNNHISYLDPSAFGGLSQLQKLY LSGNFLTQFPMDLYVGRFKLAELMFLDVSYNRIPSMPMHHINL VPGKQLRGIYLHGNPFVCD\CSLVSLLVFWYRRHFSSVMDFKN DYTCRLWSDSRHSRQVLLLQDSFMNCSDSIINGSFRALGFIHE AQVGERLMVHCDSKTGNANTDFIWVGPDNRLLEPDKEMENFYV FHNGSLVIESPRFEDAGVYSCIAMNKQRLLNETVDVTINVSNF TVSRSHAHEAFNTAFTTLAACVASIVLVLLYLYLTPCPCKCKT KRQKNMLHQSNAHSSILSPGPASDASADERKAGAGKRVVFLEP LKDTAAGQNGKVRLFPSEAVIAEGILKSTRGKSDSDSVNSVFS DTPFVAST
416	1155	2	1928	ASDFIRSLDHCGYLSLEGVFSHKFDFELQDVSSVNEDVLLTTG LLCKYTAQRFKPKYKFFHKSFQEYTAGRRLSSLLTSHEPEEVT KGNGYLQKMVSISDITSTYSSLLRYTCGSSVEATRAVMKHLAA VYQHGCLLGLSIAKRPLWRQESLQSVKNTTEQEILKAININSF VECGIHLYQESTSKSALSQEFEAFFQGKSLYINSGNIPDYLFD FFEHLPNCASALDFIKLGFYGGAMASWEKAAEDTGGIHMEEAP ETYIPSRAVSLFFNWKQEFRTLEVTLRDFSKLNKQDIRYLGKI FSSATSLRLQIKRCAGVAGSLSLVLSTCKNIYSLMVEASPLTI EDERHITSVTNLKTLSIHDLQNQRLPGGLTDSLGNLKNLTKLI MDNIKMNEEDAIKLAEGLKNLKKMCLFHLTHLSDIGEGMDYIV KSLSSEPCDLEEIQLVSCCLSANAVKILAQNLHNLVKLSILDL SENYLEKDGNEALHELIDRMNVLEQLTALMLPWGCDVQGSLSS LLKHLEEVPQLVKLGLKNWRLTDTEIRILGAFFGKNPLKNFQQ LNLAGNRVSSDGWLAFMGVFENLKQLVFFDFSTKEFLPDPALV RKLSQVLSKLTFLQEARLVGWQFDDDDLSVITGAFKLVTA
417	1156	342	718	ASDRKVAMTCDCFWFRTMLDQHASCMEVGTERERQAG\GLVMF DPSGFPTGEKVLQDDEFTCDLFRFLQLLCEGHNSGL*VPGTSD DTKA*IMFSSQ**QEPVSSNYASF*RQQIILEHGSALGSG

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418	1157	1	135	EITHIVGETAAFLCPRLRLRRGGKDGSPKPGFLASVIPVDRRP GE*DITHIVGETAAFLCPRLRLRRGGKDGSPKPGFLASVIPVD RRPGE \
419	1158	173	943	SKFIFYVDSQSMIFFFQTPTRHKVLIMEFCPCGSLYTVLEEPS NAYGLPESEFLIVLRDVVGGMNHLRENGIVHRDIKPGNIMRVI GEDGQSVYKLTDFGAARELEDDEQFVSLYGTEEYLHPDMYERA VLRKDHQ\KKYGAT\VDLW\SIGVTFYQGKPTGS\LAI*HPFE GASVRNKASDGIKIITGKGLLGAIS\GVQKSKKNG\PI\DWEW EDMPVSCSPSSGVLRVPNLPPVLA\NILESRSRKKCWGF*PSF LQEN
420	1159	987	500	GSTISCERSLRSLWTAHWALPEMDSRIPYDDYPVVFLPAYENP PAWIPPHERVHHPDYNNELTQFLPRTITLKKPPGAQLGFNIRG GKASQLGIFISKVIPDSDAHRAGLQEGDQVLAVNDVDFQDIEH SKAVEILKTAREISMRVRFFPNYHRQKERTVH
421	1160	3	890	HEQVSALHRRIKAIVEVAAMCGVNIICFQEAWTMPFAFCTREK LPWTEFAESAEDGPTTRFCQKLAKNHDMVVVSPILERDSEHGD VLWNTAVVISNSGAVLGKTRKNHIPRVGDFNESTYYMEGNLGH PVFQTQFGRIAVNICYGRHHPLNWLMYSINGAEIIFNPSATIG ALSESLWPIEARNAAIANHCFTCAINRVGTEHFPNEFTSGDGK KAHQDFGYFYGSSYVAAPDSSRTPGLSRSRDGLLVAKLDLNLC QQVNDVWNFKMTGRYEMYARELAEAVKSNYSPTIVKE

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422	1161	5214	352	MAKSGGCGAGAGVGGGNGALTWVNNAAKKEESETANKNDSSKK LSVERVYQKKTQLEHILLRPDTYIGSVEPLTQFMWVYDEDVGM NCREVTFVPGLYKIFDEILVNAADNKQRDKNMTCIKVSIDPES NIISIWNNGKGIPVVEHKVEKVYVPALIFGQLLTSSNYDDDEK KVTGGRNGYGAKLCNIFSTKFTVETACKEYKHSFKQTWMNNMM KTSEAKIKHFDGEDYTCITFQPDLSKFKMEKLDKDIVALMTRR AYDLAGSCRGVKVMFNGKKLPVNGFRSYVDLYVKDKLDETGVA LKVIHELANERWDVCLTLSEKGFQQISFVNSIATTKGGRHVDY VVDQVVGKLIEVVKKKNKAGVSVKPFQVKNHIWVFINCLIENP TFDSQTKENMTLQPKSFGSKCQLSEKFFKAASNCGIVESILNW VKFKAQTQLNKKCSSVKYSKIKGIPKLDDANDAGGKHSLECTL ILTEGDSAKSLAVSGLGVIGRDRYGVFPLRGKILNVREASHKQ IMENAEINNIIKIVGLQYKKSYDDAQSLKTLRYGKIMIMTDQD QDGSHIKGLLINFIHHNWPSLLKHGFLEEFITPIVKASKNKQE LSFYSIPEFDEWKKHIENQKAWKIKYYKGLGTSTAKEAKEYFA DMERHRILFRYAGPEDDAAITLAFSKKKIDDRKEWLTNFMEDR RQRRLHGLPEQFLYGTATKHLTYNDFINKELILFSNSDNERSI PSLVDGFKPGQRKVLFTCFKRNDKREVKVAQLAGSVAEMSAYH HGEQALMMTIVNLAQNFVGSNNINLLQPIGQFGTRLHGGKDAA SPRYIFTMLSTLARLLFPAVDDNLLKFLYDDNQRVEPEWYIPI IPMVLINGAEGIGTGWACKLPNYDAREIVNNVRRMLDGLDPHP MLPNYKNFKGTIQELGQNQYAVSGEIFVVDRNTVEITELPVRT WTQVYKEQVLEPMLNGTDKTPALISDYKEYHTDTTVKFVVKMT EEKLAQAEAAGLHKVFKLQTTLTCNSMVLFDHMGCLKKYETVQ DILKEFFDLRLSYYGLRKEWLVGMLGAEFTKLNNQARFILEKI QGKITI*NRSKKDLIQMLVQRGYESDPVKAWKEAQEKAAEEDE TQNQHDDSSSDSGTPSGPDFNYILNMSLWSLTKEKVEELIKQR DAKGREVNDLKRKSPSDLWKEDLAAFVEELDKVESQEREDVLA GMSGKAIKGKVGKPKVKKLQLEETMPSPYGRRIIPEITAMKAD ASKKLLKKKKGDLDTAAVKVEFDEEFSGAPVEGAGEEALTPSV PINKGPKPKREKKEPGTRVRKTPTSSGKPSAKKVKKRNPWSDD ESKSESDLEETEPVVIPRDSLLRRAAAERPKYTFDFSEEEDDD ADDDDDDNNDLEELKVKASPITNDGEDEFVPSDGLDKDEYTFS PGKSKATPEKSLHDKKSQDFGNLFSFPSYSQKSEDDSAKFDSN EEDSASVFSPSFGLKQTDKVPSKTVAAKKGKPSSDTVPKPKRA PKQKKVVEAVNSDSDSEFGIPKKTTTPKGKGRGAKKRKASGSE NEGDYNPGRKTSKTTSKKPKKTSFDQDSDVDIFPSDFPTEPPS LPRTGRARKEVKYFAESDEEEDDVDFAMFN
423	1162	1	219	KGCLAASFNCIFLYTGELYPTMIR*VEA*WENDSLFLGKDILL CTGQTPELNQVHPSPKAPPNTHHCKAHSSH

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424	1163	1454	446	ENSFECKDCGKAFSRGYQLSHHQKIHTGEKPYECKECKKAFRW GNQLTQHQKIHTGEKPYECKDCGKAFRWGSSLVIHKRIHTGEK PYECKDCGKAFRRGDELTQHQRFHTGEKDYECKDCGKTFSRVY KLIQHKRIHSGEKPYECKDCGKAFICGSSLIQHKRIHTGEKPY ECQECGKAFTRVNYLTQHQKIHTGEKPHECKECGKAFRWGSSL VKHERIHTGEKPYKCTECGKAFNCGYHLTQHERIHTGETPYKC KECGKAFIYGSSLVKHERIHTGVKPYGCTECGKSFSHGHQLTQ HQKTHSGAKSYECKECGKACNHLNHLREHQRIHNS
425	1164	826	407	HQYLDDLYPLHVMTILLKSHFFTMLKRPVGSSSFASLPFYHQS ILLRKNQMKRKKTQQDLTHINWTLQAVSIQTCIWLQKKPSSYF HQLPNQVL*PENSGPESCLYDLAAVVVHHGSG
426	1165	464	29	XLDPDTLPAVATLLMDVMFYSNGVKDPMATGDDCGHIRFFSFS LIEGYISLVMDVQTQQRFPSNLLFTSASGELWKMVRIGGQPLG FGPVWESGPTGPTSPLILPVTPSSSHRQAASQVTTTKQGQWLC LKRPSARSPDHTACLG*
427	1166	649	901	EAPLTSVCFSLERRFGSSSNTTSFGTLASQNAPTFGSLSQQTS GFGTQSSGFSGFGSGTGGFSFGSNNS*VSPFLSLTLIKSIK
428	1167	3	340	EEPQGSPIWVWLAGSLTSVSCFLPFQRMRIKPHQGQYIGEMSF LQHHKGECRPQKD*ARQENPCGPCSERRKHLLGQDPKTCKCSC KNTDSRCKARPLELNERTCRCDKPRR
429	1168	355	1312	TLWAGPGLCPQSHSSSSVPAPWEPHVERALRTDRNQGQRPLLS ASWAPAPARPLFLTSPVLLPKSRAIPAARDPS*AGIFCLLEMA GGQASVVIIGSAGVLGCRWGSSGKSHSLSPSRKGNLHLLSQEP QTTVVHNATDGIKGSTESCNTTTEDEDLKVRKQEIIKITEQLI EAINNGDFEAYTKICDPGLTSFEPEALGNLVEGMDFHKFYFEN REWVRAADILLPAPLPLCLCLLLTFSSQLPTFPLFDLRAALLL CMLVPLCPDGCRQAPLKALLLSSKCHSFCSCFVAVPVTTIKLT YFLPGAVAYACNPNTLGG
430	1169	439	728	ERAGAGGAAACRAGTRSGATSRTPWPLHRQLSMMLMLAQSNPQ LFALMGTRAGIARELERVEQQSRLEQLSAAELQSRNQGHWADW LQAYRARLGQ
431	1170	3	440	NGTLFIMVMHIKDLVSDYKE*WL*RKPLPW*EALLLRDCFFF* VTENGADPNPYVKTYLLPDNHKTSKRKTKISRKTRNPTFNEML VYSGYSKETLRQRELQLSVLSAESLRENFFLGGVTLPLKDFNL SKETVKWYQLTAATYL

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432	1171	433	1824	LHRIMQLAVVVSQVLENGSSVLVCLEEGWDITAQVTSLVQLLS DPFYRTLEGFQMLVEKEWLSFGHKFSQRSSLTLNCQGSGFAPV FLQFLDCVHQVHNQYPTEFEFNLYYLKFLAFHYVSNRFKTFLL DSDYERLEHGTLFDDKGEKHAKKGVCIWECIDRMHKRSPIFFN YLYSPLEIEALKPNVNVSSLKKWDYYIEETLSTGPSYDWMMLT PKHFPSEDSDLAGEAGPRSQRRTVWPCYDDVSCTQPDALTSLF SEIEKLEHKLNQAPEKWQQLWERVTVDLKEEPRTDRSQRHLSR SPGIVSTNLPSYQKRSLLHLPDSSMGEEQNSSISPSNGVERRA ATLYSQYTSKNDENRSFEGTLYKRGALLKGWKPRWFVLDVTKH QLRYYDSGEDTSCKGHIDLAEVEMVIPAGPSMGAPKHTSDKAF FDLKTSKRVYNFCAQDGQSAQQWMDKIQSCISDA
433	1172	1714	946	EVEGPRRVSPAPETLGMEESVVRPSVFVVDGQTDIPFTRLGRS HRRQSCSVARVGLGLLLLLMGAGLAVQGWFLLQLHWRLGEMVT RLPDGPAGSWEQLIQERRSHEVNPAAHLTGANSSLTGSGGPLL WETQLGLAFLRGLSYHDGALVVTKAGYYYIYSKVQLGGVGCPL GLASTITHGLYKRTPRYPEELELLVSQQSPCGRATSSSRVWWD SSFLGGVVHLEAGEEVVVRVLDERLVRLRDGTRSYFGAFMV
434	1173	16	367	QSAELGPRRREGSRRPSCTKASKPWRRRPGGPTSGLG*GPLSP GPYQCRPSLPAQLYPQSLMAAATLRTPTQVSAASSRPHTPSPT HVLKPSVRGACSSPRCPGSGTLRRSWVGPFF
435	1174	27	1139	LWWPPLSRHAAHRQWPGPTAPRGLGHKVKGRGASPAAMWSCSW FNGTGLVEELPACQDLQLGLSLLSLLGLVVGVPVGLCYNALLV LANLHSKASMTMPDVYFVNMAVAGLVLSALAPVHLLGPPSSRW ALWSVGGEVHVALQIPFNVSSLVAMYSTALLSLDHYIERALPR TYMASVYNTRHVCGFVWGGALLTSFSSLLFYICSHVSTRALEC AKMQNAEAADATLVFIGYVVPALATLYALVLLSRVRREDTPLD RDTGRLEPSAHRLLVATVCTQFGLWTPHYLILLGHTVIISRGK PVDAHYLGLLHFVKDFSKLLAFSSSFVTPLLYRYMNQSFPSKL QRLMKKLPCGDRHCSPDHMGVQQVLA
436	1175	322	756	SESELFTLMPSLPTTNCVHSLQMIPPLSPAPNQELVLGLCYMS YLAFLYMTFDFCCLYFSTVYAPSFKYICVHTDTHICVCVCIYL SSVVSKSSAEADGVLQPRRHPASLLIVFATSISESSLLIFSFQ KTEAKLIVFAVSLAAK
437	1176	2	153	FFFLRQSLTLSPRLECSGATSASPSAGITGMSHHSQPIVNFLR ACIPISK
438	1177	1	692	RQHAEERGRRNPKTGLTLERVGPESSPYLLRRHQRQGQEGEHY HSCVQLAPTRGLEES/GHGPL/SLAGGPRVGGV/AAAATEAPR MEWKVKVRSDGTRYVAKRPVRDRLLKARALKIREERSGMTTDD DAVSEMKMGRYWSKEERKQHLIRAREQRKRREFMMQSRLECLR EQQNGDSKPELNIIALSHRKTMKKRNKKILDNWITIQEMLAHG ARSADGKRVYNPLLSVTTV

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439	1178	2	616	SDRGCSAAAGRNMTAVGVQAQRPLGQRQPRRSFFESFIRTLII TCVALAVVLSSVSICDGHWLLAEDRLFGLWHFCTTTNQSVPIC FRDLGQAHVPGLAVGMGLVRSVGALAVVAAIFGLEFLMVSQLC EDKHSQCKWVMGSILLLVSFVLSSGGLLGFVILLRNQVTLIGF TLMFWCEFTASFLLFLNAISGLHINSITHPWE
440	1179	2	540	QILPNLYLGSARDSANLESLAKLGIRYILNVTPNLPNFFEKNG DFHYKQIPISDHWSQNLSRFFPEAIEFIDEALSQNCGVLVHCL AGVSRSVTVTVAYLMQKLHLSLNDAYDLVKRKKSNISPNFNFM GQLLDFERSLRLEERHSQEQGSGGQASAASNPPSFFTTPTSDG AFELAPT ·
441	1180	940	463	RKSLHENKLKRLQEKVEVLEAKKEELETENQVLNRQNVPFEDY TRLQKRLKDIQRRHNEFRSLILVPNMPPTASINPVSFQSSAMG SKHGTTISSSYAGGTTSKGTLSTSQKTRRTGNNTKKTTRGTWI FRRMMFLENRQIKRGEVGDSVKLDILTCGI
442	1181	1	986	GRPGAGASELFPSVTTDLSVSKQNACLTCVDFVTVHVCMGFWG IGPGALSTSCIPYPLSHGPGSVKAEMLHMYSQKDPLILCVRLA VLLAVTLTVPVVLFPIRRALQQLLFPGKAFSWPRHVAIALILL VLVNVLVICVPTIRDIFGVIGSTSAPSLIFILPSIFYLRIVPS EVEPFLSWPKIQALCFGVLGVLFMAVSLGFMFANWATGQSRMS GH*SGPAGPGPCAHAHGGVRAAP*GPSCPTCGGGWFP*TWLSE AGDSRGCRLAHFPPPQGCQAWIMALIPTPTPWEEEEEEEEEEE EEEEEEEEEARSWWSLCPAQSSLPPPG
443	1182	460	27	INELRYHLEESRDKNVLLCLEERDWDPGLAIIDNLMQSINQSK KTVFVLTKKYAKSWNFKTAFYLALQRLMDENMDVIIFILLEPV LQHSQYLRLRQRICKSSILQWPDNPKAEGLFWQTLRNVVLTEN DSRYNNMYVDSIKQY
444	1183	1682	230	DDPIKTSWTPPRYVLSMSEERHERVRKKYHILVEGDGIPPPIK SFKEMKFPAAILRGLKKKGIHHPTPIQIQGIPTILSGRDMIGI AFTGSGKTLVFTLPVIMFCLEQEKRLPFSKREGPYGLIICPSR ELARQTHGILEYYCRLLQEDSSPLLRCALCIGGMSVKEQMETI RHGVHMMVATPGRLMDLLQKKMVSLDICRYLALDEADRMIDMG FEGDIRTIFSYFKGQRQTLLFSATMPKKIQNFAKSALVKPVTI NVGRAGAASLDVIQEVEYVKEEAKMVYLLECLQKTPPPVLIFA EKKADVDAIHEYLLLKGVEAVAIHGGKDQEERTKAIEAFREGK KDVLVATDVASKGLDFPAIQHVINYDMPEEIENYVHRIGRTGR SGNTGIATTFINKACDESVLMDLKALLLEAKQKVPPVLQVLHC GDESMLDIGGERGCAFCGGLGHRITDCPKLEAMQTKQVSNIGR KDYLAHSSMDF
445	1184	1	375	IETTQPSEDTNANSQDNSMQPETSSQQQLLSPTLSDRGGSRQD AADAGKPQRKFGQWRLPSAPKPISHSVSSVNLRFGGRTTMKSV VCKMNPMTDAASCGSEVKKWWTRQLTVESDESGDDLLDI
446	1185	2	223	NDRFSACYFTLKLKEAAVRQREALKKLTKNIATDSYISVNLRD VYARSIMEMLRLKGRERASTRSSGGDDFWF

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447	1186	2	1031	FTVFILGITIRPLVEFLDVKRSNKKQQAVSEEIYCRLFDHVKT GIEDVCGHWGHNFWRDKFKKFDDKYLRKLLIRENQPKSSIVSL YKKLEIKHAIEMAETGMISTVPTFASLNDCREEKIRKVTSSET DEIRELLSRNLYQIRQRTLSYNRHSLTADTSERQAKEILIRRR HSLRESIRKDSSLNREHRASTSTSRYLSLPKNTKLPEKLQKRR TISIADGNSSDSDADAGTTVLNLQPRARRFLPEQFSKKSPQSY KMEWKNEVDVDSGRDMPSTPPTPHSREKGTQTSGLLQQPLLSK DQSGSEREDSLTEGIPPKPPPRLVWRASEPGSRKARFGSEKP
448	1187	3	444	HEEASGLSVWMGKQMEPLHAVPPAAITLILSLLVAVFTECTSN VATTTLFLPIFASMSRSIGLNPLYIMLPCTLSASFAFMLPVAT PPNAIVFTYGHLKVADMVKTGVIMNIIGVFCVFLAVNTWGRAI FDLDHFPDWANVTHIET
449	1188	3	125	HELENNWLQHEKAPTEEGKKELLALSNANPSLLERHCAYL
450	1189	1	188	GNIIYMYMQPGARSSQDQGKFLTLFYNIVTPLLNPLIYTLRNR EVKGALGRLLLGKRELGKE
451	1190	10	1879	PLEQRSNCRVDPRVRTHTMASDTSSLVQSHTYKKREPADVPYQ TGQLHPAIRVADLLQHITQMKCAEGYGFKEEYESFFEGQSAPW DSAKKDENRMKNRYGNIIAYDHSRVRLQTIEGDTNSDYINGNY IDGYHRPNHYIATQGPMQETIYDFWRMVWHENTASIIMVTNLV EVGRVKCCKYWPDDTEIYKDIKVTLIETELLAEYVIRTFAVEK RGVHEIREIRQFHFTGWPDHGVPYHATGLLGFVRQVKSKSPPS AGPLVVHCSAGAGRTGCFIVIDIMLDMAEREGVVDIYNCVREL RSRRVNMVQTEEQYVFIHDAILEACLCGDTSVPASQVRSLYYD MNKLDPQTNSSQIKEEFRTLNMVTPTLRVEDCSIALLPRNHEK NRCMDILPPDRCLPFLITIDGESSNYINAALMDSYKQPSAFIV TQHPLPNTVKDFWRLVLDYHCTSVVMLNDVDPAQLCPQYWPEN GVHRHGPIQVEFVSADLEEDIISRIFRIYNAARPQDGYRMVQQ FQFLGWPMYRDTPVSKRSFLKLIRQVDKWQEEYNGGEGRTVVH CLNGGGRSGTFCAISIVCEMLRHQRTVDVFHAVKTLRNNKPNM VDLLDQYKFCYEVALEYLNSG
452	1191	603	342	PLTYNKKYTYPWWGDALGWLLALSSMVCIPAWSLYRLGTLKGP FRERIRQLMCPAEDLPQRNPAGPSAPATPRTSLLRLTELESHC
453	1192	120	449	TLSESGALFSLGPPPLSLKSSSAPRPYSTLRDCLEHFAELFDL GFPNPLAERIIFETHQIHFANCSLGQPTFSDPPEDVLLAMIIA PICLIPFLITLVVWRSKDSEAQA .
454	1193	1838	1066	CEEREQEKDDVDVALLPTIVEKVILPKLTVIAENMWDPFSTTQ TSRMVGITLKLINGYPSVVNAENKNTQVYLKALLLRMRRTLDD DVFMPLYPKNVLENKNSGPYLFFQRQFWSSVKLLGNFLQWYGI FSNKTLQELSIDGLLNRYILMAFQNSEYGDDSIKKAQNVINCF PKQWFMNLKGERTISQLENFCRYLVHLADTIYRNSIGCSDVEK RNARENIKQIVKLLASVRALDHAMSVASDHNVKEFKSLIEGK

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455	1194	112	1361	TPFCFLCSLVFRSRVWAEPCLIDAAKEEYNGVIEEFLATGEKL FGPYVWGRYDLLFMPPSFPFGGMENPCLTFVTPCLLAGDRSLA DVIIHEISHSWFGNLVTNANWGEFWLNEGFTMYAQRRISTILF GAAYTCLEAATGRALLRQHMDITGEENPLNKLRVKIEPGVDPD DTYNETPYEKGFCFVSYLAHLVGDQDQFDSFLKAYVHEFKFRS ILADDFLDFYLEYFPELKKKRVDIIPGFEFDRWLNTPGWPPYL PDLSPGDSLMKPAEELAQLWAAEELDMKAIEAVAISPWKTYQL VYFLDKILQKSPLPPGNVKKLGDTYPSISNARNAELRLRWGQI VLKNDHQEDFWKVKEFLHNQGKQKYTLPLYHAMMGGSEVAQTL AKETFASTASQLHSNVVNYVQQIVAPKGS
456	1195	1	889	CASGSSGWRPVLWAGAFTMASAELDYTIEIPDQPCWSQKNSPS PGGKEAETRQPVVILLGWGGCKDKNLAKYSAIYHKRGCIVIRY TAPWHMVFFSESLGIPSLRVLAQKLLELLFDYEIEKEPLLFHV FSNGGVMLYRYVLELLQTRRFCRLRVVGTIFDSAPGDSNLVGA LRALAAILERRAAMLRLLLLVAFALVVVLFHVLLAPITALFHT HFYDRLQDAGSRWPELYLYSRADEVVLARDIERMVEARLARRV LARSVDFVSSAHVSHLRDYPTYYTSLCVDFMR\NWVRC
457	1196	2	295	PRVRDRLPSTGVRDRKGDKPWKESGGSVEAPRMGFTHPPGHLS GCQSSLASGETGTGSADPPGGPRPGLTRRAPVKDTPGRAPAAD AAPAGPSSCLG
458	1197	1299	682	QGRTSCIGLYTYQRRICKYRDQYNWFFLARPTTFAIIENLKYF LLKKDPSQPFYLGHTIKSGDLEYVGMEGGIVLSVESMKRLNSL LNIPEKCPEQGGMIWKISEDKQLAVCLKYAGVFAENAEDADGK DVFNTKSVGLSIKEAMTYHPNQVVEGCCSDMAVTFNGLTPNQM HVMMYGVYRLRAFG\HIFNDALVFLPPNGSDND
459	1198	779	61	HEGKPTRGRGRGGSLSTRGRGSEVPDSAHLAPTPLFSESGCCG LRSRFLTDCKMEEGGNLGGLIKMVHLLVLSGAWGMQMWVTFVS GFLLFRSLPRHTFGLVQSKLFPFYFHISMGCAFINLCILASQH AWAQLTFWEASQLYLLFLSLTLATVNARWLEPRTTAAMWALQT VEKERGLGGEVPGSHQGPDPYRQLREKDPKYSALRQNFFRYHG LSSLCNLGCVLSNGLCLA\ALPWK
460	1199	517	815	KQLDKQLRADPSGSLPPLPPSPPPPLEAGGRPPEVP/PRGPSA VPSFPSVSGDWGGPVEAG/EGGQQGRGRARARPCSLPPLLPPS PVCRLSGSRAPLGCDG
461	1200	1	583	RNQLSSQKSVPWVPILKSLPLWAIVVAHFSYNWTFYTLLTLLP TYMKEILRFNVQENGFLSSLPYLGSWLCMILSGQAADNLRAKW NFSTLCVRRIFSLIGMIGPAVFLVAAGFIGCDYSLAVAFLTIS TTLGGFCSSGFSINHLDIAPSYAGILLGITNTFATIPGMVGPV IAKSLTPDMGISLHRPGWSAVA
462	1201	25	383	GPSGTTHASAHSGHPGSPRGSLSRHPSSQLAGPGVEGGEGTQK PRDYIILAILSCFCPMWPVNIVAFAYAVMSRNSLQQGDVDGAQ RLGRVAKLLSIVALVGGVLIIIASCVINLGVYK
463	1202	573	372	SLFLSFPPLSFKMTLNDAMRNKARLSITGSTGENGRVMTPEFP KAVHAVPYVSPGMGMNVSVTDLS

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464	1203	2018	491	DDVPPPAPDLYDVPPGLRRPGPGTLYDVPRERVLPPEVADGGV VDSGVYAVPPPAEREAPAEGKRLSASSTGSTRSSQSASSLEVA GPGREPLELEVAVEALARLQQGVSATVAHLLDLAGSAGATGSW RSPSEPQEPLVQDLQAAVAAVQSAVHELLEFARSAVGNAAHTS DRALHAKLSRQLQKMEDVHQTLVAHGQALDAGRGGSGATLEDL DRLVACSRAVPEDAKQLASFLHGNASLLFRRTKATAPGPEGGG TLHPNPTDKTSSIQSRPLPSPPKFTSQDSPDGQYENSEGGWME DYDYVHLQGKEEFEKTQKELLEKGSITRQGKSQLELQQLKQFE RLEQEVSRPIDHDLANWTPAQPLAPGRTGGLGPSDRQLLLFYL EQCEANLTTLTNAVDAFFTAVATNQPPKIFVAHSKFVILSAHK LVFIGDTLSRQAKAADVRSQVTHYSNLLCDLLRGIVATTKAAA LQYPSPSAAQDMVERVKELGHSTQQFRRVLGQLAAA
465	1204	299	189	EMEEPQKSYVNTMDLERDEPLKSTGPQISVSEFSCHCCYDILV NPTTLNCGHSFCRHCLALWWASSKKTECPECREKWEGFPKVSI LLRDAIEKLFPDAIRLRFEDIQQNNDIVQSLAAFQKYGNDQIP LAPNTGRANQQMGGGFFSGVLTALTGVAVVLLVYHWSSRESEH DLLVHKAVAKWTAEEVVLWLEQLGPWASLYRERFLSERVNGRL LLTLTEEEFSKTPYTIENSSHRRAILMELERVKALGVKPPQNL WEYKAVNPGRSLFLLYALKSSPRLSLLYLYLFDYTDTFLPFIH TICPLQEDSSGEDIVTKLLDLKEPTWKQWREFLVKYSFLPYQL IAEFAWDWLEVHYWTSRFLIINAMLLSVLELFSFWRIWSRSEL K*VGFRFLRLGVAALGSVEVAGLRGVVKGERPLLYGHGAGARF PHSVLLLPVAKPLPLPLLPRGLC
466	1205	2	242	EKARMIYEDYISILSPKEVSLDSRVREVINRNLLDPNPHMYED AQLQIYTLMHRDSFPRFLNSQIYKSFVESTAGSSSES
467	1206	2	619	LYYSQDEESKIMISDFGLSKMEGKGDVMSTACGTPGYVAPEVL AQKPYSKAVDCWSIGVIAYILLCGYPPFYDENDSKLFEQILKA EYEFDSPYWDDISDSAKDFIRNLMEKDPNKRYTCEQAARHPWI AGDTALNKNIHESVSAQIRKNFAKSKWRQAFNATAVVRHMRKL HLGSSLDSSNASVSSSLSLASQKDCASGTFHAL
468	1207	1	352	RTRGGAVSFEDFIKGLSILLRGTVQEKLNWAFNLYDINKDGYI TKEEMLDIMKAIYDMMGKCTYPVLKEDAPRQHVETFFQKMDKN KDGVVTIDEFIESCQKDENIMRSMQLFENVI
469	1208	3	1015	PRSPEHHTPAWHEGRSLGPIMASMADRNMKLFSGRVVPAQGEE TFENWLTQVNGVLPDWNMSEEEKLKRLMKTLRGPAREVMRVLQ ATNPNLSVADFLRAMKLVFGESESSVTAHGKFFNTLQAQGEKA SLYVIRLEVQLQNAIQAGIIAEKDANRTRLQQLLLGGELSRDL RLRLKDFLRMYANEQERLPNFLELIKMVREEEDWDDAFIKRKR PKRSESMVERAVSPVAFQGSPPIVIGSADCNVIEIDDTLDDSD EDVILVESQDPPLPSWGAPPLRDRARPQDEVLVIDSPHNSRAQ FPSTSGGSGYKNNGPGEMRRARKRKHTIRCSYCGEE
470	1209	1543	1351	SVACTVPLRSMSDPDQDFDKEPDSDSTKHSTPSNSSNPSGPPS PNSPHRSQLPLEGLEQPACDT

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471	1210	3	952	YSAVEFAERGSGGSSGDELREDDEPVKKRGRKGRGRGPPSSSD SEPEAELEREAKKSAKKPQSSSTEPARKPGQKEKRVRPEEKQQ AKPVKVERTRKRSEGFSMDRKVEKKKEPSVEEKLQKLHSEIKF ALKVDSPDVKRCLNALEELGTLQVTSQILQKNTDVVATLKKIR RYKANKDVMEKAAEVYTRLKSRVLGPKIEAVQKVNKAGMEKEK AEEKLAGEELAGEEAPQEKAEDKPSTDLSAPVNGEATSQKGES AEDKEHEEGRDSEEGPRCGSSEDLHDSVREGPDLDRPGSDRQE RERARGDSEALDEES
472	1211	5204	2901	LAELSSLSVLRLSHNSISHIAEGAFKGLRSLRVLDLDHNEISG TIEDTSGAFSGLDSLSKLTLFGNKIKSVAKRAFSGLEGLEHLN LGGNAIRSVQFDAFVKMKNLKELHISSDSFLCDCQLKWLPPWL IGRMLQAFVTATCAHPESLKGQSIFSVPPESFVCDDFLKPQII TQPETTMAMVGKDIRFTCSAASSSSSPMTFAWKKDNEVLTNAD MENFVHVHAQDGEVMEYTTILHLRQVTFGHEGRYQCVITNHFG STYSHKARLTVNVLPSFTKTPHDITIRTTTMARLECAATGHPN PQIAWQKDGGTDFPAARERRMHVMPDDDVFFITDVKIDDAGVY SCTAQNSAGSISANATLTVLETPSLVVPLEDRVVSVGETVALQ CKATGNPPPRITWFKGDRPLSLTERHHLTPDNQLLVVQNVVAE DAGRYTCEMSNTLGTERAHSQLSVLPAAGCRKDGTTVGIFTIA VVSSIVLTSLVWVCIIYQTRKKSEEYSVTNTDETVVPPDVPSY LSSQGTLSDRQETVVRTEGGPQANGHIESNGVCPRDASHFPEP DTHSVACRQPKLCAGSAYHKKPWKAMEKAEGTPGPHKMEHGGR VVCSDCNTEVDCYSRGQAFHPQPVSRDSAQPSAPNGPEPGGSD QEHSPHHQCSRTAAGSCPECQGSLYPSNHDRMLTAVKKKPMAS LDGKGDSSWTLARLYHPDSTELQPASSLTSGSPERAEAQYLLV SNGHLPKACDASPESTPLTGQLPGKQRVPLLLAPKS

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473	1212	2	2466	AAAGAARRVSVRCGRSGPGPGRGAAGLSPADIALASEQGASCS VRAPERKLRMKLLWQAKMSSIQDWGEEVEEGAVYHVTLKRVQI QQAANKGARWLGVEGDQLPPGHTVSQYETCKIRTIKAGTLEKL VENLLTAFGDNDFTYISIFLSTYRGFASTKEVLELLLDRYGNL TSPNCEEDGSQSSSESKMVIRNAIASILRAWLDQCAEDFREPP HFPCLQKLLDYLTRMMPGSDPERRAQNLLEQFQKQEVETDNGL PNTISFSLEEEEELEGGESAEFTCFSEDLVAEQLTYMDAQLFK KVVPHHCLGCIWSRRDKKENKHLAPTIRATISQFNTLTKCVVS TILGGKELKTQQRAKIIEKWINIAHECRLLKNFSSLRAIVSAL QSNSIYRLKKTWAAVPRDRMLMFEELSDIFSDHNNHLTSRELL MKEGTSKFANLDSSVKENQKRTQRRLQLQKDMGVMQGTVPYLG TFLTDLTMLDTALQDYIEGGLINFEKRREFEVIAQIKLLQSA CNSYCMTPDQKFIQWFQRQQLLTEEESYALSCEIEAAADASTT SPKPWKSMVKRLNLLFLGADMITSPTPTKEQPKSTASGSSGES MDSVSVSSCESNHSEAEEGYITPMDTPDEPQKKLSESSSYCSS IHSMDTNFLQGMSSLINPLSSPPSCNNNPKIHKRSVSVTSITS TVLPPVYNQQNEDTCIIRISVEDNNGNMYKSIMLTSQDKTPAV IQRAMLKHNLDSDPAEEYELVQVISEDKELVIPDSANVFYAMN SQVNFDFILRKKNSMEEQVKLRSRTSLTLPRTAKRGCWSNRHS KITL
474	1213	1	867	AREKMDSCIEAFGTTKQKRALNTRRMNRVGNESLNRAVAKAAE TIIDTKGVTALVSDAIHNDLQDDSLYLPPCYDDAAKPEDVYKF EDLLSPAEYEALQSPSEAFRNVTSEEILKMIEENSHCTFVIEA LKSLPSDVESRDRQARCIWFLDTLIKFRAHRVVKRKSALGPGV PHIINTKLLKHFTCLTYNNGRLRNLISDSMKAKITAYVIILAL HIHDFQIDLTVLQRDLKLSEKRMMEIAKAMRLKISKRRVSVAA GSEEDHKLGTLSLPLPPAQTSDRLAKRRKIT

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475	1214	2	2621	LSLFGSRALGRSGARAMAKAKKVGARRKASGAPAGARGGPAKA NSNPFEVKVNRQKFQILGRKTRHDVGLPGVSRARALRKRTQTL LKEYKERDKSNVFRDKRFGEYNSNMSPEEKMMKRFALEQQRHH EKKSIYNLNEDEELTHYGQSLADIEKHNDIVDSDSDAEDRGTL SGELTAAHFGGGGGLLHKKTQQEGEEREKPKSRKELIEELIAK SKQEKRERQAQREDALELTEKLDQDWKEIQTLLSHKTPKSENR DKKEKPKPDAYDMMVRELGFEMKAQPSNRMKTEAELAKEEQEH LRKLEAERLRRMLGKDEDENVKKPKHMSADDLNDGFVLDKDDR RLLSYKDGKMNVEEDVQEEQSKEASDPESNEEEGDSSGGEDTE ESDSPDSHLDLESNVESEEENEKPAKEQRQTPGKGLISGKERA GKATRDELPYTFAAPESYEELRSLLLGRSMEEQLLVVERIQKC NHPSLAEGNKAKLEKLFGFLLEYVGDLATDDPPDLTVIDKLVV HLYHLCQMFPESASDAIKFVLRDAMHEMEEMIETKGRAALPGL DVLIYLKITGLLFPTSDFWHPVVTPALVCLSQLLTKCPILSLQ DVVKGLFVCCLFLEYVALSQRFIPELINFLLGILYIATPNKAS QGSTLVHPFRALGKNSELLVVSAREDVATWQQSSLSLRWASRL RAPTSTEANHIRLSCLAVGLALLKRCVLMYGSLPSFHAIMGPL RALLTDHLADCSHPQELQELCQSTLTEMESQKQLCRPLTCEKS KPVPLKLFTPRLVKVLEFGRKQGSSKEEQERKRLIHKHKREFK GAVREIRKDNQFLARMQLSEIMERDAERKRKVKQLFNSLATQE GEWKALKRKKFKK
476	1215	3	961	LTKQEDCCGSIGTAWGQSKCHKCPQLQYTGVQKPGPVRGEVGA DCPQGYKRLNSTHCQDINECAMPGVCRHGDCLNNPGSYRCVCP PGHSLGPSRTQCIADKPEEKSLCFRLVSPEHQCQHPLTTRLTR QLCCCSVGKAWGARCQRCPTDGTAAFKEICPAGKGYHILTSHQ TLTIQGESDFSLFLHPDGPPKPQQLPESPSQAPPPEDTEEERG VTTDSPVSEERSVQQSHPTATTTPARPYPELISRPSPPTMRWF LPDLPPSRSAVEIAPTQVTETDECRLNQNICGHGECVPGPPDY SCHCNPGYRSHPQHRYCV

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477	1216	3652	1207	MAGGHCGSFPAAAAGSGEIVQLNVGGTRFSTSRQTLMWIPDSF FSSLLSGRISTLRDETGAIFIDRDPAAFAPILNFLRTKELDLR GVSINVLRHEAEFYGITPLVRRLLLCEELERSSCGSVLFHGYL PPPGIPSRKINNTVRSADSRNGLNSTEGEARGNGTQPVLSGTG EETVRLGFPVDPRKVLIVAGHHNWIVAAYAHFAVWYRIKESSG WQQVFTSPYLDWTIERVALNAKVVGGPHGDKDKMVAVASESSI ILWSVQDGGSGSEIGVFSLGVPVDALFFIGNQLVATSHTGKVG VWNAVTQHWQVQDVVPITSYDTAGSFLLLGCNNGSIYYIDMQK FPLRMKDNDLLVTELYHDPSNDAITALSVYLTPKTSVSGNWIE IAYGTSSGAVRVIVQHPETVGSGPQLFQTFTVHRSPVTKIMLS EKHLVSVCADNNHVRTWTVTRFRGMISTQPGSTPLASFKILSL EETESHGSYSSGNDIGPFGERDDQQVFIQKVVPITNKLFVRLS STGKRICEIQAVDCTTISSFTGRECEGSSRMGSRPRRYLFTGH TNGSIQMWDLTTAMDMVNKSEDKDVGGPTEEELLKLLDQCDLS TSRCATPNISPATSVVQHSHLRESNSSLQLQHHDTTHEAATYG SMRPYRESPLLARARRTESFHSYRDFQTINLNRNVERAVPENG NLGPIQAEVKGATGECNISERKSPGVEIKSLRELDSGLEVHKI AEGFSESKKRSSEDENENKIEFRKKGGFEGGGFLGRKKVPYLA SSPSTSDGGTDSPGTASPSPTKTTPSPRHKKSDSSGQEYSL
478	1217	1	1379	RRPTRPILTDELFKRTIQLPHLKTLILNGNKLETLSLVSCFAN NTPLEHLDLSQNLLQHKNDENCSWPETVVNMNLSYNKLSDSVF RCLPKSIQILDLNNNQIQTVPKETIHLMALRELNIAFNFLTDL PGCSHFSRLSVLNIEMNFILSPSLDFVQSCQEVKTLNAGRNPF RCTCELKNFIQLETYSEVMMVGWSDSYTCEYPLNLRGTRLKDV HLHELSCNTALLIVTIVVIMLVLGLAVAFCCLHFDLPWYLRML GQCTQTWHRVRKTTQEQLKRNVRFHAFISYSEHDSLWVKNELI PNLEKEDGSILICLYESYFDPGKSISENIVSFIEKSYKSIFVL SPNFVQNEWCHYEFYFAHHNLFHENSDHIILILLEPIPFYCIP TRYHKLKALLEKKAYLEWPKDRRKCGLFWANLRAAINVNVLAT REMYELQTFTELNEESRGSTISLMRTDCL
479	1218	1	1099	PTRPPTRPPTRPLLTPSWTSTGRMWSHLNRLLFWSIFSSVTCR KAVLDCEAMKTNEFPSPCLDSKTKVVMKGQNVSMFCSHKNKSL QITYSLFRRKTHLGTQDGKGEPAIFNLSITEAHESGPYKCKAQ VTSCSKYSRDFSFTIVDPVTSPVLNIMVIQTETDRHITLHCLS VNGSLPINYTFFENHVAISPAISKYDREPAEFNLTKKNPGEEE EYRCEAKNRLPNYATYSHPVTMPSTGGDSCPFCLKLLLPGLLL LLVVIILILAFWVLPKYKTRKAMRNNVPRDRGDTAMEVGIYAN ILEKQAKEESVPEVGSRPCVSTAQDEAKHSQELQYATPVFQEV APREQEACDSYKSGYVYSELNF
480	1219	1	293	FFFFEERRTGSHSVGHPRMEYSGVSMAHCSLNLLGSSNSPSSA SQDARTTGACQHAQLIGFFFF\VETASPQVTHAG/LKHLVSRN PSAVTSQSARIKT

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481	1220	1	727	NREGARKIQNKWLRPSPRSHRTPESVSPERYSYGTSSSSKRTE GSCRRRRQSSSSANSQQGQWETGSPPTKRQRRSRGRPSGGAKR RRRGAPAAPQQQSEPARPSSEGKVTCDIRLRVRAEYCEHGPAL EQGVASRRPQALARQLDVFGQATAVLRSRDLGSVVCDIKFSEL SYLDAFWGDYLSGALLQALRGVFLTEALREAVGREAVRLLVSV DEADYEAGRRRLLLMEEEGGRRPTEAS
482	1221	1	1321	APNTAELRICRVNKNCGSVRGGDEIFLLCDKVQKDDIEVRFVL NDWEAKGIFSQADVHRQVAIVFKTPPYCKAITEPVTVKMQLRR PSDQEVSESMDFRYLPDEKDTYGNKAKKQKTTLLFQKLCQDHV ETGFRHVDQDGLELLTSGDPPTLASQSAGITVNFPERPRPGLL GSIGEGRYFKKEPNLFSHDAVVREMPTGVSSQAESYYPSPGPI SSGLSHHASMAPLPSSSWSSVAHPTPRSGNTNPLSSFSTRTLP SNSQGIPPFLRIPVGNDLNASNACIYNNADDIVGMEASSMPSA DLYGISDPNMLSNCSVNMMTTSSDSMGETDNPRLLSMNLENPS CNSVLDPRDLRQLHQMSSSSMSAGANSNTTVFVSQSDAFEGSD FSCADNSMINESGPSNSTNPNSHGFVQDSQYSGIGSMQNEQLS DSFPYEFFQV
483	1222	1	1311	RRLSLLDLQLGPLGRDPPQECSTFSPTDSGEEPGQLSPGVQFQ RRQNQRRFSMEDVSKRLSLPMDIRLPQEFLQKLQMESPDLPKP LSRMSRRASLSDIGFGKLETYVKLDKLGEGTYATVFKGRSKLT ENLVALKEIRLEHEEGAPCTAIREVSLLKNLKHANIVTLHDLI HTDRSLTLVFEYLDSDLKQYLDHCGNLMSMHNVKIFMFQLLRG LAYCHHRKILHRDLKPQNLLINERGELKLADFGLARAKSVPTK TYSNEVVTLWYRPPDVLLGSTEYSTPIDMWGVGCIHYEMATGR PLFPGSTVKEELHKINRLLGTPTEETWPGVTAFSEFRTYSFPC YLPQPLINHAPRLDTDGIHLLSSLLLYESKSRMSAEAALSHSY FRSLGERVHQLEDTASIFSLKEIQLQKDPGYRGLAFQQPGRGK NRRQSIF
484	1223	807	356	CTPHGSSSSWKIPLWPRHMSPLHSCLPVGTSTSSGPLAVPRDC FHLCCLWGQLLLISCPLACGQGCRVAGGQQHVPGQALGTLSPL VSLLTWAGPSLDWPHPGSLVTPRCPILPAVPVLVKGLGGWPPT RPSRAAPVSGPWDQLPYFPGL
485	1224	1199	370	LISPVWGNIQRSRSVPLFPSGLVLGGIWARGPLLALLASFNII SVLNAECYLKQILHPTSHFTVSETPPLSGNDTDSLSCDSGSSA TSTPCVSRLVTGHHLWASKNGRHVLGLIEDYEALLKQISQGQR LLAEMDIQTQEAPSSTSQELGTKGPHPAPLSKFVSSVSTAKLT LEEAYRRLKLLWRVSLPEDGQCPLHCEQIGEMKAEVTKLHKKL FEQEKKLQNTMKLLQLSKRQEKVIFDQLVVTHKILRKARGNLE LRPGGAHPGTCSPSRPGS

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486	1225	2469	1660	LGLFCILPIDTLCAVLERDTLSIRESRLFGAVVRWAEAECQRQ QLPVTFGNKQKVLGKALSLIRFPLMTIEEFAAGPAQSGILSDR EVVNLFLHFTVNPKPRVEYIDRPRCCLRGKECCINRFQQVESR WGYSGTSDRIRFTVNRRISIVGFGLYGSIHGPTDYQVNIQIIE YEKKQTLGQNDTGFSCDGTANTFRVMFKEPIEILPNVCYTACA TLKGPDSHYGTKGLKKVVHETPAASKTVFFFFSSPGNNNGTSI EDGQIPEIIFYT
487	1226	1193	372	SVWWNSEVKDWMQKKRRGLRNSRATAGDIAHYYRDYVVKKGLG HNFVSGAVVTAVEWGTPDPSSCGAQDSSPLFQVSGFLTRNQAQ QPFSLWARNVVLATGTFDSPARLGIPGEALPFIHHELSALEAA TRVGAVTPASDPVLIIGAGLSAADAVLYARHYNIPVIHAFRRA VDDPGLVFNQLPKMLYPEYHKVHQMMREQSILSPSPYEGYRSL PRHQLLCFKEDCQAVFQDLEGVEKVFGVSLVLVLIGSHPDLSF LPGAG\LTLQWILTSR
488	1227	756	1016	KLRPFIFSNQSLWLHSYEGAELEKTFIKGSWATFWVKVASCWA CVLLYLGLLLAPLCWPPTQKPQPLILRRRRHRIISPDNKYPPV
489	1228	1	747	QLIHLSHGYQIHWTDYYNVGTGRPEFGTRAAHKSLAGAELKTL KDFVTVLAKLFPGRPPVKKLLEMLQEWLASLPLDRIPYNAVLD LVNNKMRISGIFLTNHIKWVGCQGSRSELRGYPCSLWKLFHTL TVEASTHPDALVGTGFEDDPQAVLQTMRRYVHTFFGCKECGEH FEEMAKESMDSVKTPDQAILWLWKKHNMVNGRLAGEKPLGMGG SARAEGGPGPGTARTARLPWGLSLSFAASCHPLC
490	1229	4797	2398	HGGATFINAFVTTPMCCPSRSSMLTGKYVHNHNVYTNNENCSS PSWQAMHEPRTFAVYLNNTGYRTAFFGKYLNEYNGSYIPPGWR EWLGLIKNSRFYNYTVCRNGIKEKHGFDYAKDYFTDLITNESI NYFKMSKRMYPHRPVMMVISHAEPHGPEDSAPQFSKLYPNASQ HITPSYNYAPNMDKHWIMQYTGPMLPIHMEFTNILQRKRLQTL MSVDDSVERLYNMLVETGELENTYIIYTADHGYHIGQFGLVKG KSMPYDFDIRVPFFIRGPSVEPGSIVPQIVLNIDLAPTILDIA GLDTPPDVDGKSVLKLLDPEKPGNRFRTNKKAKIWRDTFLVER GKFLRKKEESSKNIQQSNHLPKYERVKELCQQARYQTACEQPG QKWQCIEDTSGKLRIHKCKGPSDLLTVRQSTRNLYARGFHDKD KECSCRESGYRASRSQRKSQRQFLRNQGTPKYKPRFVHTRQTR SLSVEFEGEIYDINLEEEEELQVLQPRNIAKRHDEGHKGPRDL QASSGGNRGRMLADSSNAVGPPTTVRVTHKCFILPNDSIHCER ELYQSARAWKDHKAYIDEEIEALQDKIKNLREVRGHLKRRKPE ECSCSKQSYYNKEKGVKKQEKLKSHLHPFKEAAQEVDSKLQLF KENNRRRKKERKEKRRQRKGEECSLPGLTCFTHDNNHWQTAPF WNLGSFCACTSSNNNTYWCLRTVNETHNFLFCEFATGFLEYFD MNTDPYQLTNTVHTVERGILNQLHVQLMELRSCQGYKQCNPRP KNLDVGNKDGGSYDLHRGQLWDGWEG

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491	1230	2480	385	HLLIAQELADRVGEGRACWSLGNAYVSMGRPAQALTFAKKHLQ ISQEIGDRHGELTARMNVAQLQLVLGRLTSPAASEKPDLAGYE AQGARPKRTQRLSAETWDLLRLPLEREQNGDSHHSGDWRGPSR DSLPLPVRSRKYQEGPDAERRPREGSHSPLDSADVRVHVPRTS IPRAPSSDEECFFDLLTKFQSSRMDDQRCPLDDGQAGAAEATA APTLEDRIAQPSMTASPQTEEFFDLIASSQSRRLDDQRASVGS LPGLRITHSNAGHLRGHGEPQEPGDDFFNMLIKYQSSRIDDQR CPPPDVLPRGPTMPDEDFFSLIQRVQAKRMDEQRVDLAGGPGA GGRRPARAPAAVPAWCELRPCAHRQAHPAPTPGRRSHSHSHVL PRPLPRTGTGHAAPRPPRPRATGSGQAARGGRACFHPGLAPMA LSFLPSAPAAGRTGPSACRPRPGAVRLPHPLPQALPVLPCPAK CETLLSPSPSPKVSLSRLLGPPRTGPCSVPPELVLGWPCDRHA PPLQLRPGAGLPPSLSPHSPARGQQPQKAPQTTHGRPGCSGSP EVPPAESQGPAGASTGAGPISKAEGMAGHELRHSKTPSQEKGQ GLVLGMLTGSKSSAQSGWEVAPGSVTLTQVGGWSVEAGEASLS STLQTPHMRTPLLPPAGGDDITALSMGRGLTGHQVRDPRTGRT CWSLRWAPGA .
492	1231	3	398	NSAADLAIFALWGLKPVVYLLASSFLGLGLHPISGHFVAEHYM FLKGHETYSYYGPLNWITFNVGYHVEHHDFPSIPGYNLPLVRK IAPEYYDHLPQHHSWVKVLWDFVFEDSLGPYARVKRVYRLAKD GL
493	1232	1	214	QESGFSCKGPGQNVAVTRAHPDSQGRRRRPERGARGGQVFYNS EYGELSEPSEEDHCSPSARVTFFTDNSY
494	1233	3	443	VIVHARPIRTRASKYYIPEAVYGLPAYPAYAGGGGFVLSGATL HRLAGACAQVELFPIDDVFLGMCLQRLRLTPEPHPAFRTFGIP QPSAAPHLSTFDPCFYRELVVVHGLSAADIWLMWRLLHGPHGP ACAHPQPVAAGPFQWDS
495	1234	1	897	MASAACSMDPIDSFELLDLLFDRQDGILRHVELGEGWGHVKDQ VLPNPDSDDFLSSILGSGDSLPSSPLWSPEGSDSGISEDLPSD PQDTPPRSGPATSPAGCHPAQPGKGPCLSYHPGNSCSTTTPGP VIQQQHHLGASYLLRPGAGHCQELVLTEDEKKLLAKEGITLPT QLPLTKYEERVLKKIRRKIRNKQSAQESRKKKKEYIDGLETRS CCCPLPSSSSPPSALLAPTKPRALGTLRLYECSPELCTTMLPP AWLLMLCQAPRPQDPDPRLTQPEKSLQEAPGQTGASRTPRT

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496	1235	4235	940	ARGRRSRPVWAASWGGRGRPAARRRPRGLAATMGFELDRFDGD VDPDLKCALCHKVLEDPLTTPCGHVFCAGCVLPWVVQEGSCPA RCRGRLSAKELNHVLPLKRLILKLDIKCAYATRGCGRVVKLQQ LPEHLERCDFAPARCRHAGCGQVLLRRDVEAHMRDACDARPVG RCQEGCGLPLTHGEQRAGGHCCARALRAHNGALQARLGALHKA LKKEALRAGKREKSLVAQLAAAQLELQMTALRYQKKFTEYSAR LDSLSRCVAAPPGGKGEETKSLTLVLHRDSGSLGFNIIGGRPS VDNHDGSSSEGIFVSKIVDSGPAAKEGGLQIHDRIIEVNGRDL SRATHDQAVEAFKTAKEPIVVQVLRRTPRTKMFTPPSESQLVD TGTQTDITFEHIMALTKMSSPSPPVLDPYLLPEEHPSAHEYYD PNDYIGDIHQEMDREELELEEVDLYRMNSQDKLGLTVCYRTDD EDDIGIYISEIDPNSIAAKDGRIREGDRIIQINGIEVQNREEA VALLTSEENKNFSLLIARAELQLDEGWMDDDRNDFLDDLHMDM LEEQHHQAMQFTASVLQQKKHDEDGGTTDTATILSNQHEKDSG VGRTDESTRNDESSEQENNGDDATASSNPLAGQRKLTCSQDTL GSGDLPFSNKSFISPECTGAAYLGIPVDECERFRELLELKCQV KSATPYGLYYPSGPLDAGKSDPESVDKELELLNEELRSIELEC LSIVRAHKMQQLKEQYRESWMLHNSGFRNYNTSIDVRRHELSD ITELPEKSDKDSSSAYNTGESCRSTPLTLEISPDNSLRRAAEG ISCPSSEGAVGTTEAYGPASKNLLSITEDPEVGTPTYSPSLKE LDPNQPLESKERRASDGSRSPTPSQKLGSAYLPSYHHSPYKHA HIPAHAQHYQSYMQLIQQKSAVEYAQSQMSLVSMCKDLSSPTP SEPRMEWKVKIRSDGTRYITKRPVRDRLLRERALKIREERSGM TTDDDAVSEMKMGRYWSKEERKQHLVKAKEQRRRREFMMQSRL DCLKEQQAADDRKEMNILELSHKKMMKKRNKKIFDNWMTIQEL LTHGTKSPDGTRVYNSFLSVTTV
497	1236	2	157	FFFLVEMGFCHVGQGGLTLIGSSNLPASASKSAGITGVSHCAR PDFKSCVE
498	1237	1	211	LAGRKVLLFVSGYVVGWGPITWLLMSEVLPLRARGVASGLCVL ASWLTAFVLTKSFLPGGVSVQPQAPGP
499	1238	2	345	FWAPGPPGVGAAVGDASTRSLRESCPSPSPGRLRRTTAPWSSQ ARAAAPAPSSSCRGPDGASSPRDLPWRPWKILRRTPLSGDVEL SQVHPDQRILRRFILSRTCGNTIPGMAE
500	1239	1	523	MRRFLSKVYSFPMRKLILFLVFPVVRQTPTQHFKNQFPALHWE HELGLAFTKNRMNYTNKFLLIPESGDYFIYSQVTFRGMTSECS EIRQAGRPNKPDSITVVITKVTDSYPEPTQLLMGTKSVCEVGS NWFQPIYLGAMFSLQEGDKLMVNVSDISLVDYTKEDKTFFGAF LL

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501	1240	2	1277	FVWDEVAQRSGCEERWLVIDRKVYNISEFTRRHPGGSRVISHY AGQDATDPFVAFHINKGLVKKYMNSLLIGELSPEQPSFEPTKN KELTDEFRELRATVERMGLMKANHVFFLLYLLHILLLDGAAWL TLWVFGTSFLPFLLCAVLLSAVQAQAGWLQHDFGHLSVFSTSK WNHLLHHFVIGHLKGAPASWWNHMHFQHHAKPNCFRKDPDINM HPFFFALGKILSVELGKQKKKYMPYNHQHKYFFLIGPPALLPL YFQWYIFYFVIQRKKWVDLAWMITFYVRFFLTYVPLLGLKAFL GLFFIVRFLESNWFVWVTQMNHIPMHIDHDRNMDWVSTQLQAT CNVHKSAFNDWFSGHLNFQIEHHLFPTMPRHNYHKVAPLVQSL CAKHGIEYQSKPLLSAFADIIHSLKESGQLWLDAYLHQ
502	1241	999	540	QCGGIPYNTTQFLMNDRDPEEPNLDVPHGISHPGSSGESEAGD SDGRGRAHGEFQRKDFSETYERFHTESLQGRSKQELVRDYLEL EKRLSQAEEETRRLQQLQACTGQQSCRQVEELAAEVQRLRTEN QRLRQENQMWNREGCRCDEEPGT
503	1242	1448	875	SPERSSLSVGREKAMEVPPPAPRSFLCRALCLFPRVFAAEAVT ADSEVLEERQKRLPYVPEPYYPESGWDRLRELFGKD\VTGSLF RINVGLRGLVAGGIIGALLGTPVGGLLMAFQKYSGETVQERKQ KDRKALHELKLEEWKGRLQVTEHLPEKIESSLQEDEPENDAKK IEALLNLPRNPSVIDKQDKD
504	1243	149	1293	RSLGLAVTEMVPWVRTMGQKLKQRLRLDVGREICRQYPLFCFL LLCLSAASLLLNRYIHILMIFWSFVAGVVTFYCSLGPDSLLPN IFFTIKYKPKQLGLQELFPQGHSCAVCGKVKCKRHRPSLLLEN YQPWLDLKISSKVDASLSEVLELVLENFVYPWYRDVTDDESFV DELRITLRFFASVLIRRIHKVDIPSIITKKLLKAAMKHIEVIV KARQKVKNTEFLQQAALEEYGPELHVALRSRRDELHYLRKLTE LLFPYILPPKATDCRSLTLLIREILSGSVFLPSLDFLADPDTV NHLLIIFIDDSPPEKATEPASPLVPFLQKFAEPRNKKPSVLKL ELKQIREQQDLLFRFMNFLKQEGAVHVLHVLFDCGGI
505	1244	2	1116	QSLAEVLQQLGASSELQAVLSYIFPTYGVTPNHSAFSMHALLV NHYMKGGFYPRGVTSEIAFHTIPVIQRAGGAVLTKATVQSVLL DSAGKACGVSVKKGHELVNIYCPIVVSNAGLFNTYEHLLPGNA RCLPGVKQQLGTVRPGLGMTSVFICLRGTKEDLHLPSTNYYVY YDTDMDQAMERYVSMPREEAAEHIPLLFFAFPSAKDPTWEDRF PGRSTMIMLIPTAYEWFEEWQAELKGK\RGSDYETFKNSFVEA SMSVVLKLFPQLEGKVESVTAGSPLTNQFYL\AAPRGACYGAD HDLGRLHPCVMASLRAQSPIPNLYLTGQDIFTCGLVGALQGAL LCSSTILKRNLYSDLKNLDSRIRAQKKKN
506	1245	1759	873	RPQETRVLQVSCGRAHSLVLTDREGVFSMGNNSYGQCGRKVVE NEIYSESHRVHRMQDFDGQVVQVACGQDHSLFLTDKGEVYSCG WGADGQTGLGHYNITSSPTKLGGDLAGVNVIQVATYGDCCLAV SADGGLFGWGNSEYLQLASVTDSTQVNVPRCLHFSGVGKVRQA ACGGTGCAVLNGEGHVFVWGYGILGKGPNLVESAVPEMIPPTL FGLTEFNPEIQVSRIRCGLSHFAALTNKGELFVWGKNIRGCLG IGRLEDQYFPWRVTMPGEPVDVACGVDHMVTLAKSFI

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SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
507	1246	520	2	LPFREWLMIVVSLSAAAVAAAFMAKCRMVLSSRYFCSHFVMSA SRARIRSSFSRTSSRRAGALYSGMLAGWPFPCFCWVLSASSSL SSQVRSLRSICSRFSHADCSWVRACCSFSTFSTYACFSRNSSS SLMTLAWALLKAWSRISMCLRWSSLAVRTAANSISNFSFSFKN
508	1247	1	1083	MQAVRATASQSLSCARAPREPTQHALRAHWFPPAAAVQPSPHS GVAAAAGTWSSAFRGEHPLVSSGLLLGVREQSFRLLRSKAGTH MYLEHTSHCPHHDDDTAMDTPLPRPRPLLAVERTGQRPLWAPS LELPKPDMQPLPAGAFLEEVAEGTPAQTESEPKVLDPEEDLLC IAKTFSYLRESGWYWGSITASEARQHLQKMPEGTFLVRDSTHP SYLFTLSVKTTRGPTNVRIEYADSSFRLDSNCLSRPRILAFPD VVSLVQHYVASCTADTRSDSPDPAPTPALPMPKEDAPSDPALP APPPATAVHLKLVQPFVRRSSARSLQHLCRLVINRLVADVDCL PLPRRMADYLRQYPFQL
509	1248	2	841	FVDIFQRWKECRGKSPAQAELSYLNKAKWLEMYGVDMHVVRGR DGCEYSLGLTPTGILIFEGANKIGLFFWPKITKMDFKKSKLTL VVVEDDDQGREQEHTFVFRLDSARTCKHLWKCAVEHHAFFRLR TPGNSKSNRSDFIRLGSRFRFSGRTEYQATHGSRLRRTSTFER KPSKRYPSRRHSTFKASNPVIAAQLCSKTNPEVHNYQPQYHPN IHPSQPRWHPHSPNVRPSFQDDRSHWKASASGDDSHFDYVHDQ NQKNLGGMQSMMYRDKLMTAL
510	1249	2	763	GGIRLIQKLTWRSRQQDRENCAMKGKHKDECHNFIKVFVPRND EMVFVCGTNAFNPMCRYYRVSIFYVICFF*STFLPSLICC*S* NLSAFQ*FVLSLVQ*KNKDRILQMEF*YK*NSIAFKRAR*IDM TLAIYFSFV\LSTL*YDGEEISGLARCPFDARQTNGALFADGK LYSATVADFLASDAVIYRSMGDGSALRTIKYDSKWIKE/PHFL YAIK/Y/GNYVYFSFREIVAT**LG/KAVDS/RVARYEKQLVG PTV
511	1250	1555	629	ARALARERESESARADDVTLGVSAILAVDRGGNLGSA\DGWAY IDVEVRRPWAFVGPGCSRSSGNGSTAYGLVGSPRWLSPFHTGG AVSLPRRPRGPGPVLGVARPCLRCVLRPE\HYEPGSHYSGFAG RDASRAFVTGDCSEAGLVDDVSDLSAAEMLTLHNWLSFYEKNY VCVGRVTGRFYGEDGLPTPALTQVEAAITRGLEANKLQLQEKQ TFPPCNAEWSSARGSRLWCSQKSGGVSRDWIGVPRKLYKPGAK EPRCVCVRTTGPPSGQMPDNPPHRNRGDLDHPNLAEYTGCPPL AITCSFPL
512	1251	1100	798	YFIICRDGVLLFCPGWSQTPGAQAILLHWATQNAGMTDMSHSA QPIYLFIYLIRTRSHYVAQAGQLLDSNDSPNVASQNVGITGMS HHAWLKIVLYFCII

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513	1252	3	1395	PAARPPSLVRLSPSPPKPRARARAPQSVEPAAPLVARGSSPPA RPAPAMVRPRRAPYRSGAGGPLGGRGRPPRPLVVRAVRSRSWP ASPRGPQPPR\IRARSAPPMEGARVFGALGPIGPSSPGLTLGG LAVSEHRLSNKLLAWSGVLEWQEKRRPYSDSTAKLKRTLPCQA YVNQGENLETDQWPQKLIMQLIPQQLLTTLGPLFRNSQLAQFH FTNRDCDSLKGLCRIMGNGFAGCMLFPHISPCEVRVLMLLYSS KKKIFMGLIPYDQSGFVSAIRQVITTRKQAVGPGGVNSGPVQI VNNKFLAWSGVMEWQEPRPEPNSRSKRWLPSHVYVNQGEILRT EQWPRKLYMQLIPQQLLTTLVPLFRNSRLVQFHFTKDLETLKS LCRIMDNGFAGCVHFSYKASCEIRVLMLLYSSEKKIFIGLIPH DQGNFVNGIRRVIANQQQVLQRNLEQEQQQRGMGG
514	1253	320	964	GRPALGREAPPQAGLSSTPPPCSETCTMGPHSILRTVHCRPTK TPPEPSAEPHPLSLLTSSNTSLAGTSLGRDLTPGGGKPPSGQT PRNPESPRHRLGSPRGRRWLASPTPTGSGRSGPASRGQRRLSC AAQDPTSEGASVGAMEAGLGPPTAAPRGVVSEAAESLGGTLSW GAWGRPPAGPSGLAGRRSRREALRPDRKEASVMMAAVSAIQP
515	1254	704	107	PGVPTHGWPRSRVLTRVRGSRGSGKMAAAVVLAAGLRAARRAV AATGVRGGQVRGAAGVTDGNEVAKAQQATPGGAAPTIFSRILD KSLPADILYEDQQCLVFRDVAPQAPVHFLVIPKKPIPRISQAE EEDQQ/LTYVPPLSL*LLGHLLLVAKQTAKAEGLGDGYRLVIN DGKLGAQSVYHLHIHVLGGRQLQWPPG
516	1255	2299	924	VPNYLPSVSSAIGGEVPQRYVWRFCIGLHSAPRFLVAFAYWNH YLSCTSPCSCYRPLCRLNFGLNVVENLALLVLTYVSSSEDF/T WVPG*GRSGEVFPEGTGLPLPHSDLPTSWCGHSLQCGSQSSFP PAIHENAFIVFIASSLGHMLLTCILWRLTKKHTVSQE\DGLSL AGAPRQPRRKSRTSVLRIRVMVRWELSSNGNPGRGVLGLGLGL GNKLRVVGQNLGL*HCVWVVWETGE*KRWRLQMGIE*GVASRR Q*VRNSVRGLVCHNSSAPPMYMGFFSPTVFGGGVGG*LHVTFI LHPPEVEAAGIPLLLGPSLPQRQGREHIVVILAAPACAPFHDR *WEPREIRPSP*ELGLRGEPTLSYPASCRVIRQPIP*DRKSYS WKQRLFIINFISFFSALAVYFRHNMYCEAGVYTIFAILEYTVV LTNMAFHMTAWWDFGNKELLITSQPEEKRF
517	1256	3	254	IDLLEIRNGPRSHESFQEMDLNDDWKLSKDEVKAYLKKEFEKH GAVVNESHHDALVEDIFDKEDEDKDGFISAREFTYKHDEL
518	1257	2	611	PRVRGRVGKEGAAAKPRSLLRRFQLLSWSVCGGNKDPWVQELM SCLDLKECGHAYSGIVAHQKHLLPTSPPISQASEGASSDIHTP AQMLLSTLQSTQRPTLPVGSLSSDKELTRPNETTIHTAGHSLA AGPEAGENQKQPEKNAGPTARTSATVPVLCLLAIIFILTAALS YVLCKRRRGQSPQSSPDLPVHYIPVAPDSNT
519	1258	1002	418	LIISNFLKAKQKPGSTPNLQQKKSQARLAPDIVSASQYRKFDE FQTGILIYELLHQPNPFEVRAQLRERDYRQEDLPPLPALSLYS PGLQQLAHLLLEADPIKRIRIGEAKRVLQCLLWGPRRELVQQP GTSEEALCGTLHNWIDMKRALMMMKFAEKAVDRRRGVELEDWL CCQYLASAEPGALLQSLKLLQLL

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520	1259	2	2019	KRGLIVVMAHEMIGTQIVTERGVALLESGTEKVLLIDSRPFVE YNTSHILEAININCSKLMKRRLQQDKVLITELIQHSAKHKVDI DCSQKVVVYDQSSQDVASLSSDCFLTVLLGKLEKSFNSVHLLA GGFAEFSRCFPGLCEGKSTLVPTCISQPCLPVANIGPTRILPN LYLGCQRDVLNKELMQQNGIGYVLNASNTCPKPDFIPESHFLR VPVNDSFCEKILPWLDKSVDFIEKAKASNGCVLVHCLAGISRS ATIAIAYIMKRMDMSLDEAYRFVKEKRPTISPNFNFLGQLLDY EKKIKNQTGASGPKSKLKLLHLEKPNEPVPAVSEGGQKSETPL SPPCADSATSEAAGQRPVHPASVPSVPSVQPSLLEDSPLVQAL SGLHLSADRLEDSNKLKRSFSLDIKSVSYSASMAASLHGFSSS EDALEYYKPSTTLDGTNKLCQFSPVQEL/CGADSRNQS**GGS Q/PSPRSCRPPGLQTARASDCIRSEPAAVAPPRGPFYLHCIEV GAWRTITTPASFSAFPP\PAAPHEVCWPGP*GLA\PDILAPQT STPSLTSSWYFATESSHFYSASAIYGGSASYSAYSCSQLPTCG DQVYSVRRRQKPSDRADSRRSWHEESPFEKQFKRRSCQMEFGE SIMSENRSREELGKVGSQSSFSGSMEIIEVS
521	1260	20	803	ASSSKRVSRQKMLQLWKLVLLCGVLTGTSESLLDNLGNDLSNV VDKLEPVLHEGLETVDNTLKGILEKLKVDLGVLQKSSAWQLAK QKAQEAEKLLNNVISKLLPTNTDIFGLKISNSLILDVKAEPID DGKGLNLSFPVTANVTEAGPIIDQIIN\LRASLDLLTAVTIET DPQTHHPVAGLGECARDPTSISLCLLDKHSQIINKFVNSVINT LKSTVSSLLQKEICPLIRIFIHSLDVNVIQQVVDNPQHKTQLQ TLI
522	1261	1246	411	CSLRRPRSAAEPDADHVPLLGLLRLQLRAARQPGAMRPQGPAA SPQRLRGLLLLLLLQLPAPSSASEIPKGKQKAQLRQREVVDLY NGMCLQGPAGVPGRDGSPGANGIPGTPGIPGRDGFKGEKGECL RESFEESWTPNYKQCSWSSLNYGIDLGKIAECTFTKMRSNSAL RVLFSGSLRLKCRNACCQRWYFTFNGAECSGPLPIEAIIYLDQ GSPEMNSTINIHRTSSVEGLCEGIGAGLVDVAIWVGTCSDYPK GDASTGWNSVSRIIIEELPK
523	1262	2009	921	MHSAMLGTRVNLSVSDFWRVMMRVCWLVRQDSRHQRIRLPHLE AVVIGRGPETKITDKKCSRQQVQLKAECNKGYVKVKQVGVNPT SIDSVVIGKDQEVKLQPGQVLHMVNELYPYIVEFEEEAKNPGL ETHRKRKRSGNSDSIERDAAQEAEAGTGLEPGSNSGQCSVPLK KGKDAPIKKESLGHWSQGLKISMQDPKMQVYKDEQVVVIKDKY PKARYHWLVLPWTSISSLKAVAR\EHLELLKHMHTVGEKVIVD FAGSSKLRFRLGYHAIPSMSHVHLHVISQDFDSPCLKNKKHWN SFNTEYFLESQAVIEMVQEAGRVTVRDGMPELLKLPLRCHECQ QLLPSIPQLKEHLRKHWTQ

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524	1263	2067	198	DMSDTSESGAGLTRFQAEASEKDSSSMMQTLLTVTQNVEVPET PKASKALEVSEDVKVSKASGVSKATEVSKTPEAREAPATQASS TTQLTDTQVLAAENKSLAADTKKQNADPQAVTMPATETKKVSH VADTKVNTKAQETEAAPSQAPADEPEPESAAAQSQENQDTRPK VKAKKARKVKHLDGEEDGSSDQSQASGTTGGRRVSKALMASMA RRASRGPIAFWARRASRTRLACFGPGEPLLSPWRSP\KARRQR GFAVRVAKFQ\SSQEPEAPPPW\DVALLQGRAN\DLVKYLLAK DQTKIPIKRS\DMLKDIIKEYTDVYPEII\ERAGYSLE\KVFG IQLKEIDKNDHLYILLSTLEPTDAGILGTTKDSPKLGLLMVLL SIIF\MNGNRS\SEAVIWEVLR/RSLGLRLGIHHS\LLGDVK\ KLITDEV\VKQKYL\DYARVPHSNSP\EYEFFWG\LRSYYEDQ QR*KSFKFACK\VQK\KDPK\EWAAQSPPGKAR/ERMEAD\LK AAS*GSPWKPRLRAEIKARMGIGLGSENAAGPCNWDEADIGPW AKARIQAGAEAKAKAQESGSASTGASTSTNNSASASASTSGGF SAGASLTATLTFGLFAGLGGAGASTSGSSGACGFSYK
525	1264	1	1397	ARPPVCTGSTMSLTVVSMACVGFFLLQGAWPLMGGQDKPFLSA RPSTVVPRGGHVALQCHYRRGFNNFMLYKEDRSHVPIFHGRIF QESFIMGPVTPAHAGTYRCRGSRPHSLTGWSAPSNPLVIMVTG NHRKPSLLAHPGPLLKSGETVILQCWSDIMFEHFFLHKEGISK DPSRLVGQIHDGVSKANFSIGPMMLALAGTYRCYGSVTHTPYQ LSAPSDPLDIVVTGPYEKPSLSAQPGPKVQAGESVTLSCSSRS SYDMYHLSREGGAHERRLPAVRKVNRTFQADFPLGPATHGGTY RCFGSFRHSPYEWSDPSDPLLVSVTGNPSSSWPSPTEPSSKSG NLRHLHILIGTSVVKIPFTILLFFLLHRWCSNKK\NAAVMDQE PAGNR\VNSEDSDEQDHQEVSYP*LEHCVFTQRKITRPSQRPK TPPTDTSMYIELPNAEPRSKVVFCPRAPQSGLEGIF

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526	1265	6657	988	LHNLRERYFSGLIYTYSGLFCVVVNPYKHLPIYSEKIVDMYKG KKRHEMPPHIYAIADTAYRSMLQDREDQSILCTGESGAGKTEN TKKVIQYLAVVASSHKGKKDTSITGELEKQLLQANPILEAFGN AKTVKNDNSSRFGKFIRINFDVTGYIVGANIETYLLEKSRAIR QARDERTFHIFYYMIAGAKEKMRSDLLLEGFNNYTFLSNGFVP IPAAQDDEMFQETVEAMAIMGFSEEEQLSILKVVSSVLQLGNI VFKKERNTDQASMPDNTAAQKVCHLMGINVTDFTRSILTPRIK VGRDVVQKAQTKEQADFAVEALAKATYERLFRWILTRVNKALD KTHRQGASFLGILDIAGFEIFEVNSFEQLCINYTNEKLQQLFN HTMFIL\EQEEYQREGIEWNFIDFGLDLQPCIELIERPNNPPG VLALLDEECWFPKATDKSFVEKLCTEQGSHPKFQKPKQLKDKT EFSIIHYAGKVDYNASAWLTKNMDPLNDNVTSLLNASSDKFVA DLWKDVDRIVGLDQMAKMTESSLPSASKTKKGMFRTVGQLYKE QLGKLMTTLRNTTPNFVRCIIPNHEKRSGKLDAFLVLEQLRCN GVLEGIRICRQGFPNRIVFQEFRQRYEILAANAIPKGFMDGKQ ACILMIKALELDPNLYRIGQSKIFFRTGVLAHLEEERDLKITD VIMAFQAMCRGYLARKAFAKRQQQLTAMKVIQRNCAAYIKLRN WQWCRLFTKV*PLLQVTRQE*EMQAKEDELQKTKERQQKAENE LKELEQKHSQLTEEKNLLQEQLQAETELYAEAEEMRVRLAAKK QELEEILHEMEARLEEEEDRGQQLQAERKKMAQQMLDLEEQLE EEEAARQKLQLEKVTAEAKIKKLEDEILVMDDQNNKLSKERKL LEERISDLTTNLAEEEEKAKNLTKLKNKHESMISELEVRLKKE EKSRQELEKLKRKLEGDASDFHEQIADLQAQIAELKMQLAKKE EELQAALARLDDEIAQKNNALKKIRELEGHISDLQEDLDSERA ARNKAEKQKRDLGEELEALKTELEDTLDSTATQQELRAKREQE VTVLKR\ALNEETRSHEAQVQEMRQKHAQAVQSLTEQLEQ*K RAKANLDKNKQTLEKENTD\LAGELRVLGQA\KQEVEHRMKKL QAQVQELQSKCSDGERARAELNDKVHK\LQNEVESVTG\MLNE AEGKAIKLAKDVASLSSQL\QDTQELLQEESRQKLNVST\SLR \QLEEERNSLQDQLDEEMEAKQNLERHISTLNIQLSDSKKKLQ DFASTVEALEEGKKRFQKEIENLTQQYEEKAAAYDKLEKTKNR LQQELDDLVVDLDNQRQLVSNLEKKQRKFDQLLAEEKNISSKY ADERDRVEAEAREKETKALSL\ARALEEALEAKEELERTNKML KA\EMGRPGSASKD\DVGQELSHDL\EKSK\RALGDPRLEEMK T\QLEELGRTELASPRRDA\KLRLEVNMQAPSRASFER\DLQA RTEQNE\ESRR\HLQRQLHEYETELEDERKQRALAAAAKIKLG WDPVRTLDL*ADSAIKGRGGKAIKQLRKLQAQMKDFQRELEDA \RASRDEIF\ATA\KENEKKAKSLEA\DLMQLQE\DLAAAEEG RKQ\ADLE\KEELAEEL\ASSLSGRNALQDEKRRLEARIAQLE EELEEEQGNMEAMSDRVRKATQQAEQLSNELATERSTAQKNES ARQQLERQNKELRSKLHEMEGAVKSKFKSTIAALEAKIAQLEE QVEQEAREKQAATKSLKQKDKKLKEILLQVEDERKMAEQYKEQ AEKGNARVKQLKRQLEEAEEESQRINANRRKLQRELDEATESN EAMGREVNALKSKLRRGNETSFVPSRRSGGRRVIENADGSEEE TDTRDADFNGTKASE

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527	1266	1	775	KLHFAKSLNSELSCSTREAMQDEDGYITLNIKTRKPALVSVGP ASSSWWRVMALILLILCVGMVVGLVALGIWSVMQRNYLQDENE NRTGTLQQLAKRFCQYVVKQSELKGTFKGHKCSPCDTNWRYYG DSCYGFFRHNLTWEESKQYCTDMNATLLKIDNRNIVEYIKAR\ THLIRWVGLSRQKSNEVWKWEDGSVISENMFEFLEDGKGNMNC AYFHNGKMHPTFCENKHYL\MCE\RKAGHDPRWTQLPLMPKRW TG
528	1267	1053	424	NQGLRDVGLCRTCLVNKIFASSILGKSHHHSLVSINQGHNAPW KAAGS\LPLKAAYC\QGFSPCDCLKYG\SWDEKDLMVPQPDTH KGSVLRWISKRGKPLAVEMEEGHCL\CLPLGTECLGVKP\IVH LFNSEMGEK\RPVAG\ARHVGSSAALLFFTPLRCLGGEKHKSG LRARPGIVPSLELNYDIDSFAHMFF/SVDLLLIITLLSYYIPF C
529	1268	1435	1560	MWWRLAPTQAIWRAAGCCMRFSRRRSTCCCLASCIFLLYKIVR GDQPAAKRRQRRRRAAPSAPPQAARLHPPPKLRRFDGVQDPAP YSWAINGKVFDVTQRPANFLRGPRGPETLSDWESQFTFKYHHV GKLLKEGEEPTVYSDEEEPKDESARKND*
530	1269	705	166	GPRMAKFLSQDQINEYKECFSLYDKQQRGKIKATDLMVAMRCL GASPTPGEVQRHLQTHGIDGNGELDFSTFLTIMHMQIKQEDPK KEILLAMLMVDKEKKGYVMASDLRSKLTSLGEKLTHKEV\DDL FRE\ADIEPNGKVKYDEFIHKI/TLLPGRDLLKEENGRASPGP ENLEQLIFL
531	1270	25	1396	ADPHTTVIRFFPAASATKRVLPPVLRVSSPRTWNPNVPESPRI PAPRLPKRMSGAPTAGAALMLCAATAVLLSAQGGPVQSKSPRF ASWDEMNVLAHGLLQLGQGLREHAERTRSQLSALERRLSACGS ACQGTEGSTDLPLAPESRVDPEVLHSLQTQLKAQNSRIQQLFH KVAQQQRHLEKQHLRIQHLQSQFGLLDHKHLDHEVAKPARRKR LPEMAQPVDPAHNVSRLHRLPRDCQELFQVGERQSGLFEIQPQ GSPPFLVNCKMTSDGGWTVIQRRHDGSVDFNRPWEAYKAGFGD PHGEFWLGLEKVHSITGDRNSRLAVQLRDWDGNAELLQFSVHL GGEDTAYSLQLTAPVAGQLGATTVPPSGLSVPFSTWDQDHDLR RDKNCAKSLSGGWWFGTCSHSNLNGQYFRSIPQQRQKLKKGIF WKTWRGRYYPLQATTMLIQPMAAEAAS
532	1271	1276	90	ALDFGDSCQWPRPQDTMKQLPVLEPGDKPRKATWYTLTVPGDS PCARVGHSCSYLPPVGNAKRGKVFIVGGANPNRSFSDVHTMDL GKHQWDLDTCKGLLPRYEHASFIPSCTPDRIWVFGGANQSGNR NCLQVLNPETRTWTTPEVTSPPPSPRTFHTSSAAIGNQLYVFG GGERGAQPVQDTKLHVFDANTLTWSQPETLGNPPSPRHGHVMV AAGTKLFIHGGLAGDRFYDDLHCIDISDMKWQKLNPTGAA\PA GCAS/HTPAVAMGK\HVYI\FGGMTPAGAPGTQCTQYHTEEQH WDPCLKF\DTPSYPPGTIGTHSHVVSFPW\PVTCASEKEDS\N SLTLNHEAEKEDSADKVMSHSGDSHEESQTATLLCLVFGGMNT EGEIYDDCIVTVVD

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533	1272	1169	639	GFSIGKATDRMDAFRKAKNRAVHHLHYIERYEDHTIFHDISLR FKRTHIKMKKQPKGYGLRCHRAIITICRLIGIKDMYAKVSGSI NMLSLTQGLFRGLSRQETHQQLADKKGLHVVEIREECGPLPIV VASPRGPLRKDPEPEDEVPDVKLDWEDVKTAQGMKRSVWSNLK RAAT
534	1273	25	1396	ADPHTTVIRFFPAASATKRVLPPVLRVSSPRTWNPNVPESPRI PAPRLPKRMSGAPTAGAALMLCAATAVLLSAQGGPVQSKSPRF ASWDEMNVLAHGLLQLGQGLREHAERTRSQLSALERRLSACGS ACQGTEGSTDLPLAPESRVDPEVLHSLQTQLKAQNSRIQQLFH KVAQQQRHLEKQHLRIQHLQSQFGLLDHKHLDHEVAKPARRKR LPEMAQPVDPAHNVSRLHRLPRDCQELFQVGERQSGLFEIQPQ GSPPFLVNCKMTSDGGWTVIQRRHDGSVDFNRPWEAYKAGFGD PHGEFWLGLEKVHSITGDRNSRLAVQLRDWDGNAELLQFSVHL GGEDTAYSLQLTAPVAGQLGATTVPPSGLSVPFSTWDQDHDLR RDKNCAKSLSGGWWFGTCSHSNLNGQYFRSIPQQRQKLKKGIF WKTWRGRYYPLQATTMLIQPMAAEAAS
535	1274	23	1102	TLRSRPAGEAGYLGWDPEQAGEGSALSRPGAMAALMTPGTGAP PAPGDFSGEGSQGLPDPSPEPKQLPELIRMKRDGGRLSEADIR GFVAAVVNGSAQGAQIGAWGGLGVPDPDWEVSPRDFGSLGVRR CPTTSTGPRVPHRCGLPPSRVPPHTRG\MLMAIRLRGMDLEET SVLTQALAQSGQQLEWPEAWRQQLVDKHSTGGVGDKVSLVLAP ALAACGCKVINHLLSRREPIPHMQQPVHPQAAPNLKPGPKPPR PYQGFSPPCSPAQFSPPRSPAQRLGPLWLQTRPLGAGKRSTDG IQTPFPLGPQTAPPREELRTSLPLPQALFPQGQVPTSSPTDTS QPRKLPFHSLTSWAPL
536	1275	3	439	RALRELRERVTHGLAEAGRDREDVSTELYRALEAVRLQNSEGS CEPCPTSWLPFGGSCYYFSVPKTTWAEAQGHCADASAHLA/IV GGLGEQDFLSRDTSALEYWIGRRAVQHLRKVQGYSWVDGVPLS FR*/WEG/HPGETWGPQVRL
537	1276	1	564	RWPRSWPPRAGAARGAAEAAMVGALCGCWFRLGGARPLIPLGP TVVQTSMSRSQVALLGLSLLLMLLLYVGLPGPPEQTSCLWGDP NVTVLAGLTPGNSPIFYREVLPLNQAHRVEV\CCFMERPLTLT RGSSWAHCSYCHRGATGPWPLTFQVLGTRHLQRRQAQRQGGQR CWSGRCGTWRYRMPCW

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538	1277	102	1549	QENQLEKKMKFLIFAFFGGVHLLSLCSGKAICKNGISKRTFEE IKEEIASCGDVAKAIINLAVYGKAQNRSYERLALLVDTVGPRL SGSKNLEKAIQIMYQNLQQDGLEKVHLEPVRIPHWERGEESAV MLEPRIHKIAILGLGSSIGTPPEGITAEVLVVTSFDELQRRAS EARGKIVVYNQPYINYSRTVQYRTQGAVEAAKVGALASLIRSV ASFSIYSPHTGIQEYQDGVPKIPTACITVEDAEMMSRMASHGI KIVIQLKMGAKTYPDTDSFNTVAEITGSKYPEQVVLVSGHLDS WDVGQGAMDDGGGAFISWEALSLIKDLGLRPKRTLRLVLWTAE EQGGVGAFQYYQLHKVNISNYSLVMESDAGTFLPTGLQFTGSE KARAIMEEVMSLLQPLNITQVLSHGEGTDINFWIQAGVPGASL LDDLYKYFFFHHSHGDTMTVHGIQTQMNV\AAAV\WAVVSYV\ VADMEEMLPRS
539	1278	2438	1148	TKPRKRRHQPASQRQRPWSSDSTGDLLARGKGRKEENKGSDRV SLAPPSLRRPMMCQSEARQGPELRAAKWLHFPQLALRRRLGQL SCMSRPALKLRSWPLTVLYYLLPFGALRPLSRVGWRPVSRVAL YKSVPTRLLSRAWGRLNQVELPHWLRRPVYSLYIWTFGVNMKE AAVEDLHHYRNLSEFFRRKLKPQARPVCGLHSVISPSDGRILN FGQVKNCEVEQVKGVTYSLESFLGPRMCTEDLPFPPAASCDSF KNQLVTREGNELYHCVIYLAPGDYHCFHSPTDWTVSHRRHFPG SLMSVNPGMARWIKELFCHNERVVLTGDWKHGFFSLTAVGAT\ NWGSIRIYFDRDLHTNSPRHSKGSYNDFSFVTHTNREGVPMRK GEHLGEFNLGSTIVLIFEAPKDFNFQLKTGQKI\RFGEALGSL
540	1279	3	1911	LPERAFGPRTPRAPRRRRRRLLLSPPPRPPPPLDREPRAPGPW LCPSRAGTAQDPARIRERRGRVAGGAAGPAMELRARGWWLLCA AAALVACARGDPASKSRSCGEVRQIYGAKGFSSS\DVPQAEIS GEHLRICPQGYTCCTSEMEENLANRSHAELETALRDSSRVLQA MLATQLRSFDDHFQHLLNDSERTLQATFPGAFGELYTQNARAF RDLYSELRLYYRGANLHLEETLAEFWARLLERLFKQLHPQLLL PDDYLDCLGKQAEALRPF\GEAP\RELRLRAT\RA\FVAAR\S FVQGLGVAS\DVVRKVAQVPLG\PEC\SRAVIEAGSYC/ALHC VGVPGARPCPDYCRNVLKGCLANQADLDAEWRNLLDSMVLITD KFWGTSGVESVIGSVHTWLAEAINALQDNRDTLTAKVIQGCGN PKVNPQGPGPEEKRRRGKLAPRERPPSGTLEKLVSEAKAQLRD VQDFWISLPGTLCSEKMALSTASDDRCWNGMARGRYLPEVMGD GLANQINNPEVEVDITKPDMTIRQQIMQLKIMTNRLRSAYNGN DVDFQDASDDGSGSGSGDGCLDDLCGRKVSRKSSSSRTPLTHA LPGLSEQEGQKTSAASCPQPPTFLLPLLLFLALTVARPRWR
541	1280	590	189	ATELTRAGMEASALTKSA\VTSVAKVVR\VASGSAVVLPLARI ATSCD*RVGGP/VQAVPMVL\SAMGLQLRAGIASSSIAAKMMS AAAIA\NGGGVSPGQPLWLLLQSLGATGL\SGLTKFILGSIGS AIA\AVIARFY

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542	1281	41	1415	TNGRNLLHHWILGVCGMHPHHQETLKKNRVVLAKQLLLSELLE HLLEKDIITLEMRELIQAKVGSFSQNVELLNLLPKRGPQAFDA FCEALRETKQGHLEDMLLTTLSGLQHVLPPLSCDYDLSLPFPV CESCPLYKKLRLSTDTVEHSLDNKDGPVCLQVKPCTPEFYQTH FQLAYRLQSRPRGLALVLSNVHFTGEKELEFRSGGDVDHSTLV TLFKLLGYDVHVLCDQTAQEMQEKLQNFAQLPAHRVTDSCIVA LLSHGVEGAIYGVDGKLLQLQEVFQLFDNANCPSLQNKPKMFF IQACRGGAIGSLGHLLLFTAATASLAL\ETDRGVDQQDGKNHA GSPGCEESDAGKEKLPKMRLPTRSDMICGYACLKGTAAMRNTK RGSWYIEALAQVFSERACDMHVADMLVKVNALIKDREGYAPGT EFHRCKEMSEYCSTLCRHLYLFPGHPPT
543	1282	862	275	VRGKEVMAALCRTRAVAAESHFLRVFLFFRPFRGVGTESGSES GSSNAKEPKTRAGGFASALERHSELLQKVEPLQKGSPKNVESF ASMLRHSPLTQMGPAKDKLVIGRIFHIVENDL\YIDFGGKFHC VCRRPEVDGEKY\QKGTRVR\LRLLDLELTSRFLGATTD\TTV LEANAVLLGIQESKDSRSKEEHLEKYI

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544	1283	2	4503	IPGASPAPRRAAPLRLGLRLASGWARAPGGVSPVPGPGMGGDA PTMARAQALVLELTFQLCAPETETPEVGCTFEEGSDPAVPCEY SQAQYDDFQWEQVRIHPGTRAPADLPHGSYLMVNTSQHAPGQR AHVIFQSLSENDTHCVQFSYFLYSRDGHSPGTLGVYVRVNGGP LGSAVWNMTGSHGRQWHQAELAVSTFWPNEYQVLFEALISPDR RGYMGLDDILLLSYPCAKAPHFSRLGDVEVNAGQNASFQCMAA GRAAEAERFLLQRQSGALVPAAGVRHISHRRFLATFPLAAVSR AEQDLYRCVSQAPRGRGTSLNFAEFMV/KEPPTPIAPPQLLRA GPTYLIIQLNTNSIIGDGPIVRKEIEYRMARGPWAEVHAVSLQ TYKLWHLDPDTEYEISVLLTRPGDGGTGRPGPPLISRTKCAEP MRAPKGLAFAEIQARQLTLQWEPLGYNVTRCHTYTVSLCYHYT LGSSHNQTI\RECVKTEQGVSRYTMKNLLPYRNVHVRLVLTNP EGRKEGKEVTFQTDEDVPSGIAAESLTFTPLEDMIFLKWEEPQ EPNGLITQYEISYQSIESSDPAVNVPGPRRTISKLRNETYHVF SNLHPGTTYLFSVRARTGKGFGQAALTEITTNISAPSFDYADM PSPLGESENTITVLLRPAQGRGAPISVYQVIVEEEQGSRRLRR EPGGQDCFPVPLTFEAALARGLVDYFGAELAASSLPEAMPFTV GDNKTYRGFWNPPLEPRKAYLIYFQAASHLKGETRLNCIRIAR KAACKESKRPLEVSQRSEEMGLILGICAGGLAVLILLLGAIIV IIRKGRDHYAYSYYPKPVNMTKATVNYRQEKTHMMSAVDRSFT DQSTLQEDERLGLSFMDTHGYSTRGDQRSGGVTEASSLLGGSP RRPCGRKGSPYHTGQLHPAVRVADLLQHINQMKTAEGYGFKQE YESFFEGWDATKKKDKVKGSRQEPMPAYDRHRVKLHPMLGDPN ADYINANYIDIRINREGYHRSNHFIATQGPKPEMVYDFWRMVW QEHCSSIVMITKLVEVGRVKCSRYWPEDSDTYGDIKIMLVKTE TLAEYVVRTFALERRGYSARHEVRQFHFTAWPEHGVPYHATGL LAFIRRVKASTPPDAGPIVIHCSAGTGRTGCYIVLDVMLDMAE CEGVVDIYNCVKTLCSRRVNMIQTEEQYIFIHDAILEACLCGE TTIPVSEFKATYKEMIRIDPQSNSSQLREEFQTLNSVTPPLDV EECSIALLPRNRDKNRSMDVLPPDRCLPFLISTDGDSNNYINA ALTDSYTRSAAFIVTLHPLQSTTPDFWGLVYDYGCTSIVMLNQ LNQSNSAWPCLQYWPEPGRQQYGLMEVEFMSGTADEDLVARVF RVQNISRLQEGHLLVRHFQFLRWSAYRDTPDSKKAFLHLLAEG DKWQAESGDGRTIVHCLNGGGRSGTFCA\CATVLEMIRCHNLV DVFFAAKTLRNYKPNMVETMDQYHFCYDVALEYLEGLESR

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545	1284	2443	1152	TKPRKRRHQPASQRQRPWSSDSTGDLLARGKGRKEENKGSDRV SLAPPSLRRPMMCQSEARQGPELRAAKWLHFPQLALRRRLGQL SCMSRPALKLRSWPLTVLYYLLPFGALRPLSRVGWRPVSRVAL YKSVPTRLLSRAWGRLNQVELPHWLRRPVYSLYIWTFGVNMKE AAVEDLHHYRNLSEFFRRKLKPQARPVCGLHSVISPSDGRILN FGQVKNCEVEQVKGVTYSLESFLGPRMCTEDLPFPPAASCDSF KNQLVTREGNELYHCVIYLAPGDYHCFHSPTDWTVSHRRHFPG SLMSVNPGMARWIKELFCHNERVVLTGDWKHGFFSLTAVGAT\ NWGSIRIYFDRDLHTNSPRHSKGSYNDFSFVTHTNREGVPMAL RGEHLG/QSFNLGSTIVLIFEAPKDFNFQLKTGQKIRFGEALG SL
546	1285	185	3057	AELGLFGSLRFSSLLHFPPRPRSPASACGPGEGRMERGLPLLC AVLALVLAPAGAFRNDKCGDTIKIESPGYLTSPGYPHSYHPSE KCEWLIQAPDPYQRIMINFNPHFDLEDRDCKYDYVEVFDGENE NGHFRGKFCGKIAPPPVVSSGPFLFIKFVSDYETHGAGFSIRY EIFKRGPECSQNYTTPSGVIKSPGFPEKYPNSLECTYI\VFAP KMSEIIL\DFESFDLEPDSNPPGGMFCRYDRLEIWDGFPDVGP HIGRYCGQKTPGRIRSSSGILSMVFYTDSAIAKEGFSANYSVL QSSVSEDFKCMEALGMESGEIHSDQITASSQYSTNWSAERSRL NYPENGWTPGEDSYREWIQVDLGLLRFVTAVGTQGAISKETKK KYYVKTYKIDVSSNGEDWITIKEGNKPVLFQGNTNPTDVVVAV FPKPLITRFVRIKPATWETGISMRFEVYGCKITDYPCSGMLGM VSGLISDSQITSSNQGDRNWMPENIRLVTSRSGWALPPAPHSY INEWLQIDLGEEKIVRGIIIQGGKHRENKVFMRKFKIGYSNNG SDWKMIMDDSKRKAKSFEGNNNYDTPELRTFPALSTRFIRIYP ERATHGGLGLRMELLGCEVEAPTAGPTTPNGNLVDECDDDQAN CHSGTGDDFQLTGGTTVLATEKPTVIDSTIQSEFPTYGFNCEF GWGSHKTFCHWEHDNHVQLKWSVLTSKTGPIQDHTGDGNFIYS QADENQKGKVARLVSPVVYSQNSAHCMTFWYHMSGSHVGTLRV KLRYQKPEEYDQLVWMAIGHQGDHWKEGRVLLHKSLKLYQVIF EGEIGKGNLGGIAVDDISINNHISQEDCAKPADLDKKNPEIKI DETGSTPGYEGEGEGDKNISRKPGNVLKTLEPILITIIAMSAL GVLLGAVCGVVLYCACWHNGMSERNLSALENYNFELVDGVKLK KDKLNTQSTYSEA
547	1286	3	521	HEGSALTWASHYQERLNSEQSCLNEWTAMADLESLRPPSAEPG GSVCGGEGLGGGEGRIMQWGAWWRGERAP*LRGSAPRSSEQEQ MEQAIRAELWKVLDVSDLESVTSKEIRQALELRLGLPLQ/PVP *LHRQPDAAAGGTAGPSLPHLPPPLPGLRVERSKPGGAAEEQV GL
548	1287	1742	1200	MAALDLRAELDSLVLQLLGDLEELEGKRTVLNARVEEGWLSLA KARYAMGAKSVGPLQYASHMEPQVCLHASEAQEGLQKFKVVRA GVHAPEEVGPREAGLRRRKGPTKTPEPESSEAPQDPLNWFGIL VPHSLRQAQASFRDGLQLAADIASLQNRIDWGRSQLRGLQEKL KQLEPGAA*

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549	1288	1	649	HSDVGAATAVLPLLTAVLGVTVVTRRDTEGPGRAALVHLTGSP RQKVGTSGREGLPGLGASCAESELERETQEPRSRGRCIFGAAR WRQVPLASPQRPFLLSPGPRLHRMGLPVSWAPPALWVLGCCAL LLSLWALCTACRRPEDAVAPRKRARRQRARLQGSATAAEAVSA KLSRGPGWGPQGTDQPSSPPVPTEADPPLLPQQVGHQTARAAP G
550	1289	433	632	LTGPGQRLAGTTEGPRRCRGSSQAPTPTWKLVDTRLCAAAPWL ASRAPGHYSQMLLVN*PCRKDWLVSKWMRTPVCGQSPAMTDRP RSEAGRDHRRAKALPGLIPGSNPNLEACGHQALCSSSVASVQG PWPLLPNASSPPTPGQPQP
551	1290	102	612	KHRLCSLEQLMTLISAAREYEIEFIYAISPGLDITFSNPKEVS TLKRKLDQVSQFGCRSFALLFDDIDHNMCAADKEVFSSFAHAQ VSITNEIYQYLGEPETFLFCPT/EYCI*WLYI*LVFLEYITYK GPWAPFSLHFPPPLVCKSRNLFLEDIFQDPKLEKF*ELINDN
552	1291	269	565	TSALTQGLERIPDQLGYLVLSEGAVLASSGDLENDEQAASAIS ELVSTACGFRLHRGMNVPFKRLSVVFGEHTLLVTVSGQRVFVV KRQNRGREPIDV
553	1292	660	233	AKRAERTSRLQGLQHPSPPYPPATLGVTPGQDRTLQLQHQCPA GRKSRKKKSKATQLSPEDRVEDALPPSKAPSRTRRAKRDLPKR TATQRPEGTSLQQDPEAPTVPKKGRRKGRQAASGHCRPRKVKA DIPSLEPEGTSAS
554	1293	590	323	RKSSWLGAVAHACNPSSLGGPGRQITRSGVRDQPGQYGETPSL LKIQTLAGRGGACL*SHILRRLRQKNRLNLGGRGCSELRSRHC APA
555	1294	1	242	AWNSARGAVSPLWVPGCFLTLSVTWIGAAPLILSRIVGGWECE KHSQPWQVLVASRGRAVCGGVLVHPQWVLTAAHCIRK
556	1295	1074	230	AEMADDLGDEWWENQPTGAGSSPEASDGEGEGDTEVMQQETVP VPVPSEKTKQPKECFLIQPKERKENTTKTRKRRKKKITDVLAK SEPKPGLPEDLQKLMKDYYSSRRLVIELEELNLPDSCFLKAND LTHSLSSYLKEICPKWVKLRKNHSEKKSVLMLIICSSAVRALE LIRSMTAFRGDGKVIKLFAKHIKVQAQVKLLEKRVVHLGVGTP GRIKELVKQGGLNLSPLKFLVFDWNWRDQKLRRMMDIPEIRKE VFELLEMGVLSLCKSESLKLGLF
557	1296	929	289	RPGTAIWVVECEHGRPIAESEGQEGRGHSPPGPCSVAGFLRGR LGRNLEIMGSTWGSPGWVRLALCLTGLVLSLYALHVKAARARD RDYRALCDVGTAISCSRVFSSRWGRGFGLVEHVLGQDSILNQS NSIFGCIFYTLQLLLGCLRTRWASVLMLLSSLVSLAGSVYLAW ILFFVLYDFCIVCITTYAINVSLMWLSFRKVQEPQGKAKRH

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558	1297	2	1063	ESPAPPAFRPAMAAVALMPPPLLLLLLLLASPPAASAPSARDPF APQLGDTQNCQLRCRDRDLGPQPSQAGLEGASESPYDRAVLIS ACERGCRLFSICRFVARSSKPNATQTECEAACVEAYVKEAEQQ ACSHGCWSQPAEPEPEQKRKVLEAPSGALSLLDLFSTLCNDLV NSAQGFVSSTWTYYLQTDNGKVVVFQTQPIVESLGFQGGRLQR VEVTWRGSHPEALEVHVDPVGPLDKVRKAKIRVKTSSKAKVES EEPQDNDFLSCMSRRSGLPRWILACCLFLSVLVMLWLSCSTLV TAPGQHLKFQPLTLEQHKGFMMEPDWPLYPPPSHACEDSLPPY KLKLDLTKL
559	1298	2	485	FPELGTSLSAMRFLAATFLLLALSTAAQAEPVQFKDCGSVDGV IKEVNVSPCPTQPCQLSKGQSYSVNVTFTSNIQSKSSKAVVHG ILMGVPVPFPIPEPDGCKSGINCPIQKDKTYSYLNKLPVKSEY PSIKLVVEWQLQDDKNQSLFCWEIPVQIVSHL
560	1299	1304	919	APETFRCVWRLQGLTFIAFTELQAKVIDTQQKVKLADIQIEQL NRTKKHAHLTDTEIMTLVDETNMYEGVGRMFILQSKEAIHSQL LEKQKIAEEKIKELEQKKSYLERSVKEAEDNIREMLMARRAQ
561	1300	3	799	HSLLLGTRVRDASSKIQGEYTLTLRKGGNNKLSRVFHRDGHYG FSEPLTFCSVVDLINHYRHESLAQYNAKLDTRLLYPVSKYQQV RAGLGAREGSTWLAPGLSFLGRPDQAMHLPSFRHVSP\DQIVK EDSVEAVGAQLKVYHQQYQDKSREYDQLYEEYTRTSQELQMKR TAIEAFNETIKIFEEQGQTQEKCSKEYLERFRREGN/QTKEMQ RILLNSERLKSRIA\EIHESPHRSWEQQLLVPRASDNKRD/ID KPH*TSLKPDL
562	1301	1772	301	AAAAAGRGRSSGRRRRRRPGALFASLGVLLGPRPPPGIPRTRA CSMGGVGEPGPREGPAQPGAPLPTFCWEQIRAHDQPGDKWLVI ERRVYDISRWAQRHPGGSRLIGHHGAEDATDAFRAFHQDLNFV RKFLQPLLIGELAPEEPSQDGPLNAQLVEDFRALHQAAEDMKL FDASPTFFAFLLGHILAMEVLAWLLIYLLGPGWVPSALAAFIL AISQAQSWCLQHDLGHASIFKKSWWNHVAQKFVMGQLKGFSAH WWNFRHFQHHAKPNIFHKDPDVTVAPVFLLGESSVEYGKKKRR YLPYNQQHLYFFLIGPPLLTLVNFEVENLAYMLVCMQWADLLW AASFYARFFLSYLPFYGVPGVLLFFVAVRVLESHWFVWITQMN HIPKEIGHEKHRDWVSSQLAATCNVEPSLFTNWFSGHLNFQIE HHLFPRMPRHNYSRVAPLVKSLCAKHGLSYEVKPFLTALVDIV RSLKKSGDIWLDAYLHQ
563	1302	424	93	KSRATRLRESAEMTGFLLPPASRGTRRSCSRSRKRQTRRRRNP SSFVASCPTLLPFACVPGASPTTLAFPPVVLTGPSTDGIPFAL SLQRVPFVLPSPQVASLPLGHSRG
564	1303	1	414	IQYRSDLELHSITMKKSGVLFLLGIILLVLIGVQGTPVVRKGR CSCISTNQGTIHLQSLKDLKQFAPSPSCEKIEIIATLKNGVQT CLNPDSADVKELIKKWEKQVSQKKKQKNGKKHQKKKVLKVRKS QRSRQKKTT

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565	1304	7	3007	IPGSTISCRGCCGKWPVQEADPPRAALRGRFPALLTRHCPSPR AEKEKRSLRRCGCRPLLVELAGPAGQAVEVLPHFESLGKQEKI PNKMSAFRNHCPHLDSVGEITKEDLIQKSLGTCQDCKVQGPNL WACLENRCSYVGCGESQVDHSTIHSQETKHYLTVNLTTLRVWC YACSKEVFLDRKLGTQPSLPHVRQPHQIQENSVQDFKIPSNTT LKTPLVAVFDDLDIEADEEDELRARGLTGLKNIGNTCYMNAAL QALSNCPPLTQFFLDCGGLARTDKKPAICKSYLKLMTELWYKS RPGSVVPTTLFQGIKTVNPTFRGYSQQDAQEFLRCLMDLLHEE LKEQVMEVEEDPQTITTEETMEEDKSQSDVDFQSCESCSNSDR AENENGSRCFSEDNNETTMLIQDDENNSEMSKDWQKEKMCNKI NKVNSEGEFDKDRDSISETVDLNNQETVKVQIHSRASEYITDV HSNDLSTPQILPSNEGVNPRLSASPPKSGNLWPGLAPPHKKAQ SASPKRKKQHKKYRSVISDIFDGTIISSVQCLTCDRVSVTLET FQDLSLPIPGKEDLAKLHSSSHPTSIVKAGSCGEAYAPQGWIA FFMEYVKRFVVSCVPSWFWGPVVTLQDCLAAFFARDELKGDNM YSCEKCKKLRNGVKFCKVQNFPEILCIHLKRFRHELMFSTKIS THVSFPLEGLDLQPFLAKDSPAQIVTYDLLSVICHHGTASSGH YIAYCRNNLNNLWYEFDDQSVTEVSESTVQNAEAYVLFYRKSS EEAQKERRRISNLLNIMEPSLLQFYISRQWLNKFKTFAEPGPI SNNDFLCIHGGVPPRKAGYIEDLVLMLPQNIWDNLYSRYGGGP AVNHLYICHTCQIEAEKIEKRRKTELEIFIRLNRAFQKEDSPA TFYCISMQWFREWESFVKGKDGDPPGPIDNTKIAVTKCGNVML RQGADSGQISEETWNFLQSIYGGGPEVILRPPVVHVDPDILQA EEKIEVETRSL
566	1305	28	450	SPSAAGGLAWVSLALGSGSRGRDHSGSGVGTAMAGALVRKAAD YVRSKDFRDYLMSTHFWGPVANWGLPIAAINDMKKSPEIISGR MTFALCCYSLTFMRFAYKVQPRNWLLFACHATNEVAQLIQGGR LIKHEMTKTASA
567	1306	133	1292	LGSRQAAGTMRGQRSLLLGPARLCLRLLLLLGYRRRCPPLLRG LVQRWRYGKVCLRSLLYNSFGGSDTAVDAAFEPVYWLVDNVIR WFGVVFVVLVIVLTGSIVAIAYLCVLPLILRTYSVPRLCWHFF YSHWNLILIVFHYYQAITTPPGYPPQGRNDIATVSICKKCIYP KPARTHHCSICNRCVLKMDHHCPWLNNCVGHYNHRYFFSFCFF MTLGCVYCSYGSWDLFREAYAAIEKMKQLDKNKLQAVANQTYH QTPPPTFSFRERMTHKSLVYLWFLCSSVALALGALTVWHAVLI SRGETSIERHINKKERRRLQAKGRVFRNPYNYGCLDNWKVFLG VDTGRHWLTRVLLPSSHLPHGNGMSWEPPPWVTAHSASVMAV
568	1307	66	962	ATRRRAAEAGMAAVLQRVERLSNRVVRVLGCNPGPMTLQGTNT YLVGTGPRRILIDTGEPAIPEYISCLKQALTEFNTAIQEIVVT HWHRDHSGGIGDICKSINNDTTYCIKKLPRNPQREEIIGNGEQ QYVYLKDGDVIKTEGATLRVLYTPGHTDDHMALLLEEENAIFS GDCILGEGTTVFEDLYDYMNSLKELLKIKADIIYPGHGPVIHN AEAKIQQYISHRNIREQQILTLFRENFEKSFTVMELVKIIYKN TPENLHEMAKHNLLLHLKKLEKEGKIFSNTDPDKKWKAHL

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569	1308	96	1017	ELHRAGQVAGGARRSRRESMELERIVSAALLAFVQTHLPEADL SGLDEVIFSYVLGVLEDLGPSGPSEENFDMEAFTEMMEAYVPG FAHIPRGTIGDMMQKLSGQLSDARNKENLQPQSSGVQGQVPIS PEPLQRPEMLKEETRSSAAAAADTQDEATGAEEELLPGVDVLL EVFPTCSVEQAQWVLAKARGDLEEAVQMLVEGKEEGPAAWEGP NQDLPRRLRGPQKDELKSFILQKYMMVDSAEDQKIHRPMAPKE APKKLIRYIDNQVVSTKGERFKDVRNPEAEEMKATYINLKPAR KYRFH
570	1309	3	526	FITGKGIVAILRCLQFNETLTELRFHNQRHMLGHHAEMEIARL LKANNTLLKMGYHFELPGPRMVVTNLLTRNQDKQRQKRQEEQK QQQLKEQKKLIAMLENGLGLPPGMWELLGGPKPDSRMQEFFQP PPPRPPNPQNVPFSQRSEMMKKPSQAPKYRTDPDSFRVVKLKR IQ
571	1310	3	1858	GGRAGTQCCWRAGARLRGISPSPALPEAPGLCRVRAGLGAGAL GRSPAGRRRRGPRVSSSPAPHPRRVLCRCLLFLFFSCHDRRGD SQPYQALKYSSKSHPSSGDHRHEKMRDAGDPSPPNKMLRRSDS PENKYSDSTGHSKAKNVHTHRVRERDGGTSYSPQENSHNHSAL HSSNFTFFLIPSN*PQGKTFRIAPYDS\ADDW/SLEHISSSGE KYYYNCRTEVSQWGKTPKSGLERGQRQKEANKMAVNSFPKDRD YRREVMQATATSGFASGKSTSGDKPVSHSCTTPSTSSASGLNP TSAPPTSASA\VPVSP\VPQ\SPIPPLLQDPNLLRQLL\PALE ATLQLNNSNVDI\SIINEVLTGDVTQASLQTIIHKCLTAGPSV FKITSLISQAAQLSTQAQASNQSPMSLTSDASSPR\SYVSPRN KAHLKLNTVPIQTFGFSTPPVSSQPKVSTPVVKQGPVSQSATQ QPVTADKQQGHEPVSPRSLQRSSSQRSPSPGPNHTSNSSNASN ATVVPQNSSARSTCSLTPALAAHFSENLIKHVQGWPADHAEKQ ASRLREEAHNMGTIHMSEICTELKNLRSLVRVCEIQATLREQR ILFLRQQIKELEKLKNQNSFMV
572	1311	2	1165	VAPECRGAYPFRAMMPGTALKAVLLAVLLVGLQTATGRLLSGQ PVCRGGTQRPCYKVIYFHDTSRRLNFEEAKEACRRDGGQLVSI ESEDEQKLIEKFIENLLPSDGDFWIGLRRREEKQSNSTACQDL YAWTDGSISQFRNWYVDEPSCGSEVCVVMYHQPSAPAGIGGPY MFQWNDDRCNMKNNFICKYSDEKPAVPSREAEGEETELTTPVL PEETQEEDAKKTFKESREAALNLAYILIPSIPLLLLLVVTTVV CWVWICRKRKREQPDPSTKKQHTIWPSPHQGNSPDLEVYNVIR KQSEADLAETRPDLKNISFRVCSGEATPDDMSCDYDNMAVNPS ESGFVTLVSVESGFVTNDIYEFSPDQMGRSKESGWVENEIYGY

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573	1312	3	1416	TEWGLSGSCPGCSPLEPGSRGRGAAAWRILRCRRLPEPSPFLT QPNLAQSQPPAPVPVTDPSVTMHPAVFLSLPDLRCSLLLLVTW VFTPVTTEITSLDTENIDEILNNADVALVNFYADWCRFSQMLH PIFEEASDVIKEEFPNENQVVFARVDCDQHSDIAQRYRISKYP TLKLFRNGMMMKREYRGQRSVKALADYIRQQKSDPIQEIRDLA EITTLDRSKRNIIGYFEQKDSDNYRVFERVANILHDDCAFLSA FGDVSKPERYSGDNIIYKPPGHSAPDMVYLGAMTNFDVTYNWI QDKCVPLVREITFENGEELTEEGLPFLILFHMKEDTESLEIFQ NEVARQLISEKGTINFLHADCDKPRHPLLHIQKTPADCPVIAI DSFRHMYVFGDFKDVLIPGKLKQFVFDLHSGKLHREFHHGPDP TDTAPGEQAQDVASSPPESSFQKLAPSEYRYTLLRDRDEL
574	1313	928	142	LTPSVGPVFPGRPTRPLASPFPVPLHRCSAGSQPPGPVPEGLI RIYSMRFCPYSHRTRLVLKAKDIRHEVVNINLRNKPEWYYTKH PFGHIPVLETSQCQLIYESVIACEYLDDAYPGRKLFPYDPYER ARQKMLLELFCKVPHLTKECLVALRCGRECTNLKAALRQEFSN LEEILEYQNTTFFGGTCISMIDYLLWPWFERLDVYGILDCVSH TPALRLWISAMKWDPTVCALLMDKSIFQGFLNLYFQNNPNAFD FGLC
575	1314	884	363	NTATNMTQPNAGTRKYSVPAISVHTSSSSFAYDREFLRTLPGF LIVAEIVLGLLVWTLIAGTEYFRVPAFGWVMFVAVFYWVLTVF FLIIYITMTYTRIPQVPWTTVGLCFNGSAFVLYLSAAVVDASS VSPERDSHNFNSWAASSFFAFLVTICYAGNTYFSFIAWRSRTI Q
576	1315	165	944	GLRDPFRRKRRLKPQVKMSNYVNDMWPGSPQEKDSPSTSRSGG SSRLSSRSRSRSFSRSSRSHSRVSSRFSSRSRRSKSRSRSRRR HQRKYRRYSRSYSRSRSRSRSRRYRERRYGFTRRYYRSPSRYR SRSRSRSRSRGRSYCGRAYAIARGQRYYGFGRTVYPEEHSRWR DRSRTRSRSRTPFRLSEKDRMELLEIAKTNAAKALGTTNIDLP ASLRTVPSAKETSRGIGVSSNGAKPEVSILGLSEQNFQKANCQ I

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577	1316	265	2300	AEGSTMDLTKMGMIQLQNPNHPTGLLCKANQMRLAGTLCDVVI MVDSQEFHAHRTVLACTSKMFEILFHRNSQHYTLDFLSPKTFQ QILEYAYTATLQAKAEDLDDLLYAAEILEIEYLEEQCLKMLET IQASDDNDTEATMADGGAEEKKDRKARYLKNIFISKHSSEESG YASVAGQSLPGPMVDQSPSVSTSFGLSAMSPTKAAVDSLMTIG QSLLQGTLQPPAGPEEPTLAGGGRHPGVAEVKTEMMQVDEVPS QDSPGAAESSISGGMGDKVEERGKEGPGTPTRSSVITSARELH YGREESAEQVPPPAEAGQAPTGRPEHPAPPPEKHLGIYSVLPN HKADAVLSMPSSVTSGLHVQPALAVSMDFSTYGGLLPQGFIQR ELFSKLGELAVGMKSESRTIGEQCSVCGVELPDNEAVEQHRKL HSGMKTYGCELCGKRFLDSLRLRMHLLAHSAGAKAFVCDQCGA QFSKEDALETHRQTHTGTDMAVFCLLCGKRFQAQSALQQHMEV HAGVRSYICSECNRTFPSHTALKRHLRSHTGDHPYECEFCGSC FRDESTLKSHKRIHTGEKPYECNGCGKKFSLKHQLETHYRVHT GEKPFECKLCHQRSRDYSAMIKHLRTHNGASPYQCTICTEYCP SLSSMQKHMKGHKPEEIPPDWRIEKTYLYLCYV
578	1317	686	908	IWEAPTLIFTLAGGRALGHPPMQKGSQGCALPHPLPGASLPAQ PGPADHRGWECRIGGEASVFTHLFCLPHSPT
579	1318	150	1204	ASGSPAPSSSSAMAAACGPGAAGYCLLLGLHLFLLTAGPALGW NDPDRMLLRDVKALTLHYDRYTTSRRLDPIPQLKCVGGTAGCD SYTPKVIQCQNKGWDGYDVQWECKTDLDIAYKFGKTVVSCEGY ESSEDQYVLRGSCGLEYNLDYTELGLQKLKESGKQHGFASFSD YYYKWSSADSCNMSGLITIVVLLGIAFVVYKLFLSDGQYSPPP YSEYPPFSHRYQRFTNSAGPPPPGFKSEFTGPQNTGHGATSGF GSAFTGQQGYENSGPGFWTGLGTGGILGYLFGSNRAATPFSDS WYYPSYPPSYPGTWNRAYSPLHGGSGSYSVCSNSDTKTRTASG YGGTRRR
580	1319	1208	276	GRCGAMAAGLARLLLLLGLSAGGPAPAGAAKMKVVEEPNAFGV NNPFLPQASRLQAKRDPSPVSGPVHLFRLSGKCFSLVESTYKY EFCPFHNVTQHEQTFRWNAYSGILGIWHEWEIANNTFTGMWMR DGDACRSRSRQSKVELACGKSNRLAHVSEPSTCVYALTFETPL VCHPHALLVYPTLPEALQRQWDQVEQDLADELITPQGHEKLLR TLFEDAGYLKTPEENEPTQLEGGPDSLGFETLENCRKAHKELS KEIKRLKGLLTQHGIPYTRPTETSNLEHLGHETPRAKSPEQLR GDPGLRGSL
581	1320	1074	132	NSFWSVLFLVQEETEVARCNAQHRLRQSRDSKPDPSFRSQPID SSISFAGSDIQPLFSFASVDGTQVGEAEEWAGPWAEATLLPGP GNRWPPRAGLSGNWLEEDGDWPSLPEVVGFVSERELFRDALGA GCRILLICEMQLTHQLDLFPECRVTLLLFKDVKNAGDLRRKAM EGTIDGSLINPTVIVDPFQILVAANKAVHLYKLGKMKTRTLST EIIFNLSPNNNISEALKKFGISANDTSILIVYIEEGEKQINQE YLISQVEGHQVSLKNLPEIMNITEVKKIYKLSSQEESIGTLLD AIICRMSTKDVL

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582	1321	5021	7694	QRSWAGPGAGPEAGTRPPARGRRRQPGNVDPRRRAPQLRSQMQ VAMARATTATGNRLWPGLLIMLGSLCHRGSPCGLSTHIEIGHR ALEFLQLHNGRVNYRELLLEHQDAYQAGIVFPDCFYPSICKGG KFHDVSESTHWTPFLNASVHYIRENYPLPWEKDTEKLVAFLFG ITSHMAADVSWHSLGLEQGFLRTMGAIDFHGSYSEAHSAGDFG GDVLSQFEFNFNYLARRWYVPVKDLLGIYEKLYGRKVITENVI VDCSHIQFLEMYGEMLAVSKLYPTYSTKSPFLVEQFQEYFLGG LDDMAFWSTNIYHLTIFMLENGTSDCNLPENPLFIACGGQQNH TQGSKMQKNDFHRNLTTSLTESVDRNINYTERGVFFSVNSWTP DSMSFIYKALERNIRTMFIGGSQLSQKHVSSPLASYFLSFPYA RLGWAMTSADLNQDGHGDLVVGAPGYSRPGHIHIGRVYLIYGN DLGLPPVDLDLDKEAHRILEGFQPSGRFGSALAVLDFNVDGVP DLAVGAPSVGSEQLTYKGAVYVYFGSKQGGMSSSPNITISCQD IYCNLGWTLLAADVNGDSEPDLVIGSPFAPGGGKQKGIVAAFY SGPSLSDKEKLNVEAANWTVRGEEDFSWFGYSLHGVTVDNRTL LLVGSPTWKNASRLGHLLHIRDEKKSLGRVYGYFPPNGQSWFT ISGDKAMGKLGTSLSSGHVLMNGTLKQVLLVGAPTYDDVSKVA FLTVTLHQGGATRMYALTSDAQPLLLSTFSGDRRFSRFGGVLH LSDLDDDGLDEIIMAAPLRIADVTSGLIGGEDGRVYVYNGKET TLGDMTGKCKSWITPCPEEKAQYVLISPEASSRFGSSLITVRS KAKNQVVIAAGRSSLGARLSGALHVYSLGSD
583	1322	1	357	SLRNSARGLKMAASAARGAAALRRSINQPVAFVRRIPWTAASS QLKEHFAQFGHVRRCILPFDKETGFHRGLGWVQFSSEEGLRNA LQQENHIIDGVKVQVHTRRPKLPQTSDDEKKDF
584	1323	1205	433	GSSNIHSASTHGFCHWFSSPSTLKRQKQAIRFQKIRRQMEAPG APPRTLTWEAMEQIRYLHEEFPESWSVPRLAEGFDVSTDVIRR VLKSKFLPTLEQKLKQDQKVLKKAGLAHSLQHLRGSGNTSKLL PAGHSVSGSLLMPGHEASSKDPNHSTALKVIESDTHRTNTPRR RKGRNKEIQDLEESFVPVAAPLGHPRELQKYSSDSESPRGTGS GALPSGQKLEELKAEEPDNFSSKVVQRGREFFDSNGNFLYRI
585	1324	134	954	ETRVKTSLELLRTQLEPTGTVGNTIMTSQPVPNETIIVLPSNV INFSQAEKPEPTNQGQDSLKKHLHAEIKVIGTIQILCGMMVLS LGIILASASFSPNFTQVTSTLLNSAYPFIGPFFFIISGSLSIA TEKRLTKLLVHSSLVGSILSALSALVGFIILSVKQATLNPASL QCELDKNNIPTRSYVSYFYHDSLYTTDCYTAKASLAGTLSLML ICTLLEFCLAVLTAVLRWKQAYSDFPGSVLFLPHSYIGNSGMS SKMTHDCGYEELLTS

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586	1325	106	1537	EMVGAMWKVIVSLVLLMPGPCDGLFRSLYRSVSMPPKGDSGQP LFLTPYIEAGKIQKGRELSLVGPFPGLNMKSYAGFLTVNKTYN SNLFFWFFPAQIQPEDAPVVLWLQGGPGGSSMFGLFVEHGPYV VTSNMTLRDRDFPWTTTLSMLYIDNPVGTGFSFTDDTHGYAVN EDDVARDLYSALIQFFQIFPEYKNNDFYVTGESYAGKYVPAIA HLIHSLNPVREVKINLNGIAIGDGYSDPESIIGGYAEFLYQIG LLDEKQKKYFQKQCHECIEHIRKQNWFEAFEILDKLLDGDLTS DPSYFQNVTGCSNYYNFLRCTEPEDQLYYVKFLSLPEVRQAIH VGNQTFNDGTIVEKYLREDTVQSVKPWLTEIMNNYKVLIYNGQ LDIIVAAALTERSLMGMDWKGSQEYKKAEKKVWKIFKSDSEVA GYIRQAGDFHQVIIRGGGHILPYDQPLRAFDMINRFIYGKGWD PYVG
587	1326	883	541	RDERAKVPFRSTEG\GRRRRRRMEAVVFVFSLLDCCALIFLSV YFIITLSDLECDYINARSCCSKLNKWVIPELIGHTIVTVLLLM SLHWFIFLLNLPVATWNIYRYIMVPSGNMGVFDPTEIHNRGQL KSHMKEAMIKLGFHLLCFFMYLYSMILALIND
588	1327	1126	732	QSPGHGAPCQLSSSHSRSNRLLSPMARATLSAAPSNPRLLRVA LLLLLLLVAASRRAAGAPLATELRCQCLQTLQGIHLKNIQSVKV KSPGPHCAQTEVIATLKNGQKACLNPASPMVKKIIEKMLKNGK SN
589	1328	197	330	HPLSLVFLALNTGKEKSHPGGGGERPGLAGQGEPDHPAGARDG R
590	1329	1	1575	CTPVARSMATTATCTRFTDDYQLFEELGKGAFSVVRRCVKKTS TQEYAAKIINTKKLSARDHQKLEREARICRLLKHPNIVRLHDS ISEEGFHYLVFDLVTGGELFEDIVAREYYSEADASHCIHQILE SVNHIHQHDIVHRDLKPENLLLASKCKGAAVKLADFGLAIEVQ GEQQAWFGFAGTPGYLSPEVLRKDPYGKPVDIWACGVILYILL VGYPPFWDEDQHKLYQQIKAGAYDFPSPEWDTVTPEAKNLINQ MLTINPAKRITADQALKHPWVCQRSTVASMMHRQETVECLRKF NARRKLKGAILTTMLVSRNFSAAKSLLNKKSDGGVKPQSNNKN SLVSPAQEPAPLQTAMEPQTTVVHNATDGIKGSTESCNTTTED EDLKVRKQEIIKITEQLIEAINNGDFEAYTKICDPGLTSFEPE ALGNLVEGMDPHKFYFENLLSKNSKPIHTTILNPHVHVIGEDA ACIAYIRLTQYIDGQGRPRTSQSEETRVWHRRDGKWLNVHYHC SGAPAAPLQ
591	1330	17	636	NRRTVKMLLELSEEHKEHLAFLPQVDSAVVAEFGRIAVEFLRR GANPKIYEGAARKLNVSSDTVQHGVEGLTYLLTESSKLMISEL DFQDSVFVLGFSEELNKLLLQLYLDNRKEIRTILSEL\APSLP SYHNLEWRLDVQLASRSLRQQIKPAVTIKLHLNQNGDHNTKVL QTDPATLLHLVQQLEQALEEMKTNHCRRVVRNIK
592	1331	1	237	GTSIYLAHRVA\RAWELAQFIHHTSKKADVVLACGDSIVHPED LICCPLTGRSCLCDVHLLSSLLARLGRGYAVSLTNL

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593	1332	2506	1684	RGCGSCGYKPSAGPAWRPRPPPAVSPLRHPEPAKVLSFSSCPL PALGRTGPSRAARAQSLTMASLFKKKTVDDVIKEQNRELRGTQ RAIIRDRAALEKQEKQLELEIKKMAKIGNKEACKVLAKQLVHL RKQKTRTFAVSSKVTSMSTQTKVMNSQMKMAGAMSTTAKTMQA VNKKMDPQKTLQTMQNFQKENMKMEMTEEMINDTLDDIFDGSD DEEESQDIVNQVLDEIGIEISGKMAKAPSAARSLPSASTSKAT ISDEEIERQLKALGVD
594	1333	905	432	STDGNGAERLFAELRKMNARGLGSELKDSIPVTELSASGPFES HDLLRKGFSCVKNELLPSHPLELSEKNFQLNQDKMNFSTLRNI QGLFAPLKLQMEFKAVQQVQRLPFLSSSNLSLDVLRGNDETIG FEDILNDPSQSEVMGEPHLMVEYKLGLL
595	1334	111	117	RNMKLHYVAVLTLAILMFLTWLPESLSCNKALCASDVSKCLIQ ELCQCRPGEGNCSCCKECMLCLGALWDECCDCVGMCNPRNYSD TPPTSKSTVEELHEPIPSLFRALTEGDTQLNWNIVSFPVAEEL SHHENLVSFLETVNQPHHQNVSVPSNNVHAPYSSDK/E*LPTV DFFHSAPSCGLSM*SIIFFEET
596	1335	817	278	VGGVPTWLEGCGSGNPSPRSGGGPGARLTLPALQMTVHNLYLF DRNGVCLHYSEWHRKKQAGIPKEEEYKLMYGMLFSIRSFVSKM SPLDMKDGFLAFQTSRYKLHYYETPTGIKVVMNTDLGVGPIRD VLHHIYSALYVELVVKNPLCPLGQTVQSELFRSRLDSYVRSLP FFSARAG
597	1336	171	881	PGLSQEPSGSMETVVIVAIGVLATIFLASFAALVLVCRQRYCR PRDLLQRYDSKPIVDLIGAMETQSEPSELELDDVVITNPHIEA ILENEDWIEDASGLMSHCIAILKICHTLTEKLVAMTMGSGAKM KTSASVSDIIVVAKRISPRVDDVVKSMYPPLDPKLLDARTTAL LLSVSHLVLVTRNACHLTGGLDWIDQSLSAAEEHLEVLREAAL ASEPDKGLPGPEGFLQEQSAI
598	1337	1078	594	VGMELPAVNLKVILLGHWLLTTWGCIVFSGSYAWANFTILALG VWAVAQRDSIDAISMFLGGLLATIFLDIVHISIFYPRVSLTDT GRFGVGMAILSLLLKPLSCCFVYHMYRERGGELLVHTGFLGSS QDRSAYQTIDSAEAPADPFAVPEGRSQDARGY
599	1338	717	116	PASRPLLGPDTGSVANIFKGLVILPEMSLVIRNLQRVIPIRRA PLRSKIEIVRRILGVQKFDLGIICVDNKNIQHINRIYRDRNVP TDVLSFPFHEHLKAGEFPQPDFPDDYNLGDIFLGVEYIFHQCK ENEDYNDVLTVTATHGLCHLLGFTHGTEAEWQQMFQKEKAVLD ELGRRTGTRLQPLTPGPLPEGAEGRVPF
600	1339	1	804	LRNALDVLHREVPRVLVNLVDFLNPTIMRQVFLGNPDKCPVQQ A/MLEPLGSKTETLDLRAEMPITCPTQNEPFLRTPRNSNYTYP IKPAIENWGSDFLCTEWKASNSVPTSVHQLRPADIKVVAALGD SLTTAVGARPNNSSDLPTSWRGLSWSIGGDGNLETHTTLPNIL KKFNPYLLGFSTSTWEGTAGLNVAAEGARARDMPAQAWDLVER MKNSPDINLEKDWKLVTLFIGGNDLCHYCENPEAHLATEYVQH IQQALDILSE

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601	1340	1	860	VVEFLWSRRPSGSSDPRPRRPASKCQMMEERANLMHMMKLSIK VLLQSALSLGRSLDADHAPLQQFFVVMEHCLKHGLKVKKSFIG QNKSFFGPLELVEKLCPEASDIATSVRNLPELKTAVGRGRAWL YLALMQKKLADYLKVLIDNKHLLSEFYEPEALMMEEEGMVIVG LLVGLNVLDANL\CLKGEDLDSQVGVIDFSLYLKDVQDLDGGK EHERITDVLDQKNYVEELNRHLSCTVGDLQTKIDGLEKTNSKL QERVSAATDRICSLQEEQQQLREQNELIR
602	1341	60	762	KPEGARRVQFVMGLFGKTQEKPPKELVNEWSLKIRKEMRVVDR QIRDIQREEEKVKRSVKDAAKKGQKDVCIVLAKEMIRSRKAVS KLYASKAHMNSVLMGMKNQLAVLRVAGSLQKSTEVMKAMQSLV KIPEIQATMRELSKEMMKAGIIEEMLEDTFESMDDQEEMEEEA EMEIDRILFEITAGALGKAPSKVTDALPEPEPPGAMAASEDEE EEEEALEAMQSRLATLRS
603	1342	3	456	RWNSIMELALLCGLVVMAGVIPIQGGILNLNKMVKQVTGKMPI LSYWPYGCHCGLGGRGQPKDATDWCCQTHDCCYDHLKTQGCGI YKDYYRYNFSQGNIHCSDKGSWCEQQLCACDKEVAFCLKRNLD TYQKRLRFYWRPHCRGQTPGC
604	1343	249	632	KTVAEEASVGNPEGAFMKMLQARKQHMSTELTIESEAPSDSSG INLSGFGSEQLDTNDESDVSSALSYILPYLSLRNLGAESILLP FTEQLFSNVQDGDRLLSILKNNRKSPSQSSLLGNKFKNKIF
605	1344	2	382	LPLTLLLAAPFAHLLLPPGHDQSPCWHPGPALSPGTLGPLSWA MANSGLQLLGYFLALGGWVGIIASTALPQWKQSSYAGDASIQL RSKVFVLESEWGGDSLGLPRDCGWSCLLHSAVRSEKGFWS
606	1345	2	987	DPRVRPPLLQPPPPLLPRLVILKMAPLDLDKYVEIARLCKYLP ENDLKRLCDYVCDLLLEESNVQPVSTPVTVCGDIHGQFYDLCE LFRTGGQVPDTNYIFMGDFVDRGYYSLETFTYLLALKAKWPDR ITLLRGNHESRQITQVYGFYDECQTKYGNANAWRYCTKVFDML TVAALIDEQILCVHGGLSPDIKTLDQIRTIERNQEIPHKGAFC DLVWSDPEDVDTWAISPRGAGWLFGAKVTNEFVHINNLKLICR AHQLVHEGYKFMFDEKLVTVWSAPNYCYRCGNIASIMVFKDVN TREPKLFRAVPDSERVIPPRTTTPYFL
607	1346	10	768	SFAGAAARPSTPPASGRGAAPGRPGPSPMDLRAGDSWGMLACL CTVLWHLPAVPALNRTGDPGPGPSIQKTYDLTRYLEHQLRSLA GTYLNYLGPPFNEPDFNPPRLGAETLPRATVDLEVWRSLNDKL RLTQNYEAYSHLLCYLRGLNRQAATAELRRSLAHFCTSLQGLL GSIAGVMAALGYPLPQPLPGTEPTWTPGPAHSDFLQKMDDFWL LKELQTWLWRSAKDFNRLKKKMQPPAAAVTLHLGAHGF
608	1347	114	700	IKISLKKRSMSGISGCPFFLWGLLALLGLALVISLIFNISHYV EKQRQDKMYSYSSDHTRVDEYYIEDTPIYGNLDDMISEPMDEN CYEQMKARPEKSVNKMQEATPSAQATNETQMCYASLDHSVKGK RRKPRKQNTHFSDKDGDEQLHAIDASVSKTTLVDSFSPESQAV EENIHDDPIRLFGLIRAKREPIN
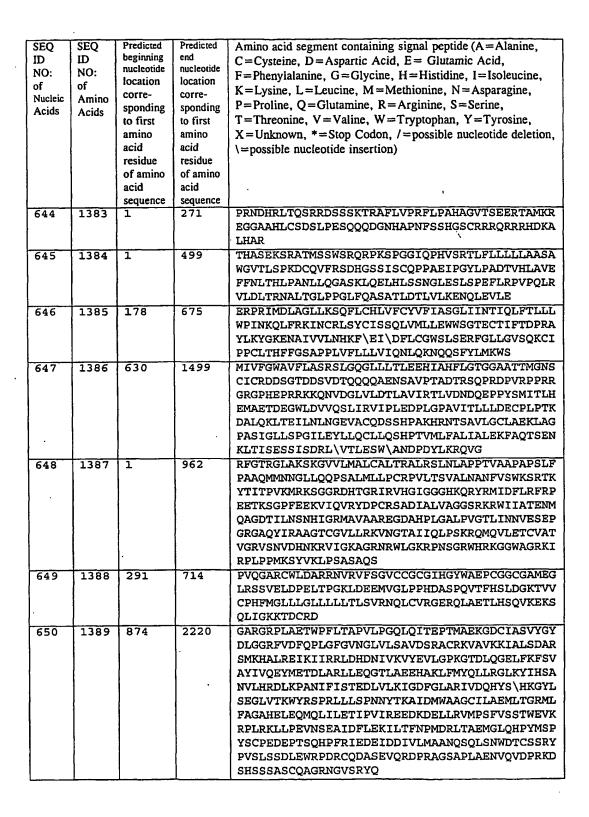
SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
609	1348	2	807	VEFHPQRARAGARAPSMGVLLTQRTLLSLVLALLFPSMASMAA IGSCSKEYRVLLGQLQKQTDLMQDTSRLLDPYIRIQGLDVPKL REHCRERPGAFPSEETLRGLGRRCFLQTLNATLGCVLHRLADL EQRLPKAQDLERSGLNIEDLEKLQMARPNILGLRNNIYCMAQL LDNSDTAEPTKAGRGASQPPTPTPASDAFQRKLEGCRFLHGYH RFMHSVGRVFSKWGESPNRSRRHSPHQALRKGVRRTRPSRKGK RLMTRGQLPR
610	1349	2	418	DFPGRRFRLVWLLVLRLPWRVPGQLDPTTGRRFSEHKLCADDE CSMLMYRGEALEDFTGPDCRFVNFKKGDPVYVYYKLARGWPEV WAGSVGRTFGYFPKDLIQVVHEYTKEELQVPTNETDFVCFDGG RDDFHNYNV
611	1350	823	115	SPLGKEGQEEVRVKIKDLNEHIVCCLCAGYFVDATTITECLHT FCKSCIVKYLQTSKYCPMCNIKIHETQPLLNLKLDRVMQDIVY KLVPGLQDSEEKRIREFYQSRGLDRVTQPTGEEPALSNLGLPF SSFDHSKAHYYRYDEQLNLCLERLSSGKDKNKSVLQNKYVRCS VRAEVRHLRRVLCHRLMLNPQHVQLLFDNEVLPDHMTMKQIWL SRWFGKPSPLLLQYSVKEKRR
612	1351	9	545	LWWYSAHAAVDAMMDVFGVGFPSKVPWKKMSAEELENQYCPSR WVVRLGAEEALRTYSQIGIEATTRARATRKSLLHVPYGDGEGE KVDIYFPDESSEATTRARATRKSLLHVPYGDGEGEKVDIYFPD ESSEALPFFLFFHGGYWQSGRHPGPHGRPGDPQRCVCPEAVSK QQAFSW
613	1352	49	902	GVRMASRGRRPEHGGPPELFYDETEARKYVRNSRMIDIQTRMA GRALELLYLPENKPCYLLDIGCGTGLSGSYLSDEGHYWVGLDI SPAMLDEAVDREIEGDLLLGDMGQGIPFKPGTFDGCISISAVQ WLCNANKKSENPAKRLYCFFASLFSVLVRGSRAVLQLYPENSE QLELITTQATKAGFSGGMVVDYPNSAKAKKFYLCLFSGPSTFI PEGLSENQDEVEPRESVFTNERFPLRMSRRGMVRKSRAWVLEK KERHRRQGREVRPDTQYTGRKRKPRF
614	1353	1960	871	TLICRMAGCGEIDHSINMLPTNRKANESCSNTAPSLTVPECAI CLQTCVHPVSLPCKHVFCYLCVKGASWLGKRCALCRQEIPEDF LDKPTLLSPEELKAASRGNGEYAWYYEGRNGWWQYDERTSREL EDAFSKGKKNTEMLIAGFLYVADLENMVQYRRNEHGRRRKIKR DIIDIPKKGVAGLRLDCDANTVNLARESSADGADSVSAQSGAS VQPLVSSVRPLTSVDGQLTSPATPSPDASTSLEDSFAHLQLSG DNTAERSHRGEGEEDHESPSSGRVPAPDTSIEETESDASSDSE DVSAVVAQHSLTQQRLLVSNANQTVPDRSDRSGTDRSVAGGGT VSVSVRSRRPDGQCTVTEV

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615	1354	5653	4549	GATPLGSVGGRTGKMDAATLTYDTLRFAEFEDFPETSEPVWIL GRKYSIFTEKDEILSDVASRLWFTYRKNFPAIGGTGPTSDTGW GCMLRCGQMIFAQALVCRHLGRDWRWTQRKRQPDSYFSVLNAF IDRKDSYYSIHQIAQMGVGEGKSIGQWYGPNTVAQVLKKLAVF DTWSSLAVHIAMDNTVVMEEIRRLCRTSVPCAGATAFPADSDR HCNGFPAGAEVTNRPSPWRPLVLLIPLRLGLTDINEAYVETLK HCFMMPQSLGVIGGKPNSAHYFIGYVGEELIYLDPHTTQPAVE PTDGCFIPDESFHCQHPPCRMSIAELDPSIAVVRGGHLSTQAF GAECCLGMTRKTFGFLRFFFSMLG
616	1355	416	65	PTTSNRAITLTAWPKIPFLGICEAKNPRSENMRLATILEVACH HLGSGPPPSWELWEQGPPGNSSRYIEFLNKHTYIKGTLRVYTK KFCMLVIKSFESKSCVCVYDFDSKSSVNVTV
617	1356	2	382	PRVRFRLLHVTSIRSAWILCGIIWILIMASSIMLLDSGSEQNG SVTSCLELNLYKIAKLQTVNYIALVVGCLLPFFTLSICYLLII RVLLKVEVPESGLRVSHRKALTTIIITLIIFFLCFLPYHT
618	1357	3	672	GRHWLGSAQLTDGGSARKPKMAVPAALILRESPSMKKAVSLIN AIDTGRFPRLLTRILQKLHLKAESSFSEEEEEKLQAAFSLEKQ DLHLVLETISFILEQAVYHNVKPAALQQQLENIHLRQDKAEAF VNTWSSMGQETVEKFRQRILAPCKLETVGWQLNLQMAHSAQAK LKSPQAVLQLGVNNEDSKSLEKVLVEFSHKELFDFYNKLETIQ AQLDSLT
619	1358	557	208	EASSAKTKRKEEKGPKAKMKLMVLVFTIGLTLLLGVQAMPANR LSCYRKILKDHNCHNLPEGVADLTQIDVNVQDHFWDGKGCEMI CYCNFSELLCCPKDVFFGPKISFVIPCNNQ
620	1359	335	1735	KMAEAVFHAPKRKRRVYETYESPLPIPFGQDHGPLKEFKIFRA EMINNNVIVRNAEDIEQLYGKGYFGKGILSRSRPSFTISDPKL VAKWKDMKTNMPIITSKRYQHSVEWAAELMRRQGQDESTVRRI LKDYTKPLEHPPVKRNEEAQVHDKLNSGMVSNMEGTAGGERPS VVNGDSGKSGGVGDPREPLGCLQEGSGCHPTTESFEKSVREDA SPLPHVCCCKQDALILQRGLHHEDGSQHIGLLHPGDRGPDHEY VLVEEAECAMSEREAAPNEELVQRNRLICRRNPYRIFEYLQLS LEEAFFLVYALGCLSIYYEKEPLTIVKLWKAFTVVQPTFRTTY MAYHYFRSKGWVPKVGLKYGTDLLLYRKGPPFYHASYSVIIEL VDDHFEGSLRRPLSWKSLAALSRVSVNVSKELMLCYLIKPSTM TDKEMESPECMKRIKVQEVILSRWVSSRERSDQDDL

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621	1360	5693	4435	RDIWTMNLQRYWGEIPISSSQTNRSSFDLLPREFRLVEVHDPP LHQPSANKPKPPTMLDIPSEPCSLTIHTIQLIQHNRRLRNLIA TAQAQNQQQTEGVKTEESEPLPSCPGSPPLPDDLLPLDCKNPN APFQIRHSDPESDFYRGKGEPVTELSWHSCRQLLYQAVATILA HAGFDCANESVLETLTDVAHEYCLKFTKLLRFAVDREARLGQT PFPDVMEQVFHEVGIGSVLSLQKFWQHRIKDYHSYMLQISKQL SEEYERIVNPEKATEDAKPVKIKEEPVSDITFPVSEELEADLA SGDQSLPMGVLGAQSERFPSNLEVEASPQASSAEVNASPLWNL AHVKMEPQESEEGNVSGHGVLGSDVFEEPMSGMSEAGIPQSPD DSDSSYGSHSTDSLMGSSPVFNQRCKKRMRKI
622	1361	15	678	REQILFIEIRDTAKGGETEQPPSLSPLHGGRMPEMGEGIQSLA RETQSHRGRRQGWDATWVTRCRESLNRGGAGAGKRAGALAHHV FLALIEPNLAEREASEEEVKACSDETVVADLLVKVVYVLGAIL KIFLREGNVLNQHSGMDIEKYSEHYQHDHSPGAEDDAAGGQLR PTAQERRHKEGSRGSPRCKRARKAVGESPGCPRPRVRPRVRPR VRPRV
623	1362	1080	835	GTRGCCREGTAYAKAYQFMASHLSLGKPVSTGSIPRFNKALFN KQAKCKPNHYSFIGLSMLSPENFSIGCKYSVWFSETKGF .
624	1363	872	441	GAQGVRVGIGEVGRVQAPRVSLLHSQGVPRGGTGEAVKEEGRG SSLHPPLPPQGLGEYAACQSHAFMKGVFTFVTGTGMAFGLQMF IQRKFPYPLQWSLLVAVVAGSVVSYGVTRVESEKCNNLWLFLE TGQLPKDRSTDQRS
625	1364	1	585	GTSELLCIQRWNWGPAFPPRPGLALAPTLQLLVEMGSAKSVPV TPARPPPHNKHLARVADPRSPSAGILRTPIQVESSPQPGLPAG EQLEGLKHAQDSDPRSPLGKN*GHGWQVGQGSDLGSPQPLPPS ASHL/YSSRASRCSQPPCLSLPWFGVRSSPANTYHVPVTSLCP SPALHYTALQAGIISTSQARAPR
626	1365	36	381	PLLLPRFIDIPCLLCYLTQVTPDDMYAKAFLIKPNTAITGTDR RKL\RADETTDFP\TLGTDQIYELLPGKDELNIVKSNAHKRDA *TAYVSGENHILSEP*KNLYPAVNTLSSYP
627	1366	763	1003	SRQPPPLLTMVFLLEFLFLVFFPGCVNQLLLSYPWQGQGTSLW SSLSFHWLLPQEDSSRLSIFPLRAGSPPQPAQAPQRI
628	1367	296	1199	KSREQSSLFAADAERSWGGKSCCLLRWRFVGKASHFPRLLPLP GEERPETKERAWKMEQTWTRDYFAEDDGEMVPRTSHTA/ASVS LTAFLSDTKDRGPPVQSQIWRSGEKVPFVQTYSLRAFEKPPQV QTQALRDFEKHLNDLKKENFSLKLLIYFLEERMQQKYEASRED IYKRNTELKVEVESLKRELQDKKQHLDKTWADVENLNSQNEAE LRRQFEERQQEMEHVYELLENKMQLLQEESRLAKNEAARMAAL VEAEKECNLELSEKLKGVTKNWEDVPGDQVKPDQYTEALAQRD K

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629	1368	191	1116	TRRRGTTWRSPRPRRASTSRPSTRPRGVASWPWETAGTATTGP GPSARTRRRAARRRRSRPRRRAHGGLSQPAGWQSLLSFTILFL AWLAGFSSRLFAVIRFESIIHEFDPWFNYRSTHHLASHGFYEF LNWFDERAWYPLGRIVGGTVYPGLMITAGLIHWILNTLNITVH IRDVCVFLAPTFSGLTSISTFLLTRELWNQGAGLLAACFIAIV PGYISRSVAGSFDNEGIAIFALQFTYYLWVKSVKTGSVFWTMC CCLSYFYMVSAWGGYVFIINLIPLHAFVLVLM/Q/RYSKRVYI *YSTFYIVG
630	1369	852	214	RRLIVVLSDAFLSRAWCSHSF/RVGPARGWVGPSVAPTPLTVP PRREGLCRLLELTRRPIFITFEGQRRDPAHPALRLLRQHRHLV TLLLWRPGSVTPSSDFWKEVQLALPRKVRYRPVEGDPQTQLQD DKDPMLILRGRVPEGRALDSEVDPDPEGDLGVRGPVFGEPSAP PHTSGVSLGESRSSEVDVSDLGSRNYSARTDFYCLVSKDDM
631	1370	246	1091	LSHEGWRRGREGERINSSVASLAPLCILPDLPSNMHLARLVGS CSLLLLLGALSGWAASDDPIEKVIEGINRGLSNAEREVGKALD GINSGITHAGREVEKVFNGLSNMGSHTGKELDKGVQGLNHGMD KVAHEINHGIGQAGKEAEKLGHGVNNAAGQAGKEADKAVQGFH TGVHQAGKEAEKLGQGVNHAADQAGKEVEKLGQGAHHAAGQAG KELQNAHNGVNQASKEANQLLNGNHQSGSSSHQGGATTTPLAS GASVNTPFINLPALWRSVANIMP
632	1371	3150	2792	SASGGLGMTVEGPEGSEREHRPPEKPPRPPRPLHLSDRSFRRK KDSVESHPTWVDDTRIDADAIVEKIVQSQDFTDGSNTEDSNLR LFVSRDGSATLSGIQLATRVSSGVYEPVVIESH
633	1372	667	993	ERSGWPQPEGTVTAQGPLFWERLSGAVTVSSGYKADMWPSFPQ \VRVGSFLFGILFFSFGSSSLPPGLPPPASLLCCAVQWGARAL FLPCLKERALGMEMRNNTLSFRQ
634	1373	636	2	SSSNLRLSFLINENILGKCFRSGPSCAGPRISPLAAQYECPRP SLLIMASVPKTNKIEPRSYSIIPSCGI\RRLGPALNTLIF\QS KRFGPRG\HSAKSIEGAPRGKGRGRAVARLAADRPPAPKIQLR AF*LQQL*YTLLELELPRLLAPDLPSNGSSLKDLKWTHSNYRA SKESCIVIF\VTTSPGREWVICALAAFLGCGS\LSQAPSPES
635	1374	61	519	LRIINTYFCFKFLIVNYIHGTTKARKPHVLGESLISAMSRQEP KMFVLLYVTSFAICASGQPRGNQLKGENYSPRYICSIPGLPGP PGPPGANGSPGPHGRIGLPGRDGRDGRKGEKGEKGTAGLRGKT GPLGLAGEKGDQGETGKKGPIGPE
636	1375	129	579	FASAMLGSRVDRPKLSVAPSVVLEEDQVLVSPAVDLEAGCRLR DFTEKIMNVKGKVILSMLVVSTVIIVFWEFINSTEGSFLWIYH SKNPEVDDSSAQKGWWFLSWFNNGIHNYQQGEEDIDKEKGREE TKGRKMTQQSFGYGTGLIQT

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637	1376	127	1376	GSHRFSLASPLDPEVGPYCDTPTMRTLFNLLWLALACSPVHTT LSKSDAKKAASKTLLEKSQFSDKPVQDRGLVVTDLKAESVVLE HRSYCSAKARDRHFAGDVLGYVTPWNSHGYĎVTKVFGSKFTQI SPVWLQLKŘRGREMFEVTGLHDVDQGWMRAVRKHAKGLHIVPR LLFEDWTYDDFRNVLDSEDEIEELSKTVVQVAKNQHFDGFVVE VWNQLLSQKRVGLIHMLTHLAEALHQARLLALLVIPPAITPGT DQLGMFTHKEFEQLAPVLDGFSLMTYDYSTAHQPGPNAPLSWV RACVQVLDPKSKWRSKILLGLNFYGMDYATSKDAREPVVGARY IQTLKDHRPRMVWDSQVSEHFFEYKKSRSGRHVVFYPTLKSLQ VRLELARELGVGVSIWELGQGLDYFYDLL
638	1377	998	48	GREGTGWGPAMSEVTRSLLQRWGASFRRGADFDSWGQLVEAID EYQILARHLQKEAQAQHNNSEFTEEQKKTIGKIATCLELRSAA LQSTQSQEEFKLEDLKKLEPILKNILTYNKEFPFDVQPVPLRR ILAPGEEENLEFEEDEEEGGAGAGSPDSFPARVPGTLLPRLPS EPGMTLLTIRIEKIGLKDAGQCINPYITVSVKDLNGIDLTPVQ DTPVASRKEDTYVHFNVDIELQKHVEKLTKGAAIFFEFKHYKP KKRFTSTKCFAFMEMDEIKLGPIVIELYKKPTDFKRKQLQLLT KKPLYLHLHQTLHKE
639	1378	1298	1569	GSITSEPSLDSLQPLPPGFKRFSCLSLPSSWDYRRPPPGLAYF CIFSRDEVSPCWPGCSPSPDLMIRLPRPPSVGITGVSHRAWPT IDNF
640	1379	196	1197	KMPVPWFLLSLALGRSPVVLSLERLVGPQDATHCSPGLSCRLW DSDILCLPGDIVPAPGPVLAPTHLQTELVLRCQKETDCDLCLR VAVHLAVHGHWEEPEDEEKFGGAADSGVEEPRNASLQAQVVLS FQAYPTARCVLLEVQVPAALVQFGQSVGSVVYDCFEAALGSEV RIWSYTQPRYEKELNHTQQLPDCRGLEVWNSIPSCWALPWLNV SADGDNVHLVLNVSEEQHFGLSLYWNQVQGPPKPRWHKNLVRP PPSQVHSHCRP\CLCK\DAVPYQRGSLKRTHPKQGKIGGGTSA FLVSLTLASSSSSLSSPTSFLYLFHRLDRRSLP
641	1380	756	1110	LRLWNRNQMMHNIIVKELIVTFFLGITVVQMLISVTGLKGVEA QNGSESEVFVGKYETLVFYWPSLLCLAFLLGRFLHMFVKALRV HLGWELQVEEKSVLEVHQGEHVKQLLRIPRP
642	1381	631	1278	KVNRKLRKKGKISHDKRKKSRSKAIGSDTSDIVHIWCPEGMKT SDIKELNIVLPEFEKTHLEHQQRIESKVCKAAIATFYVNVKEQ FIKMLKESQMLTNLKRKNAKMISDIEKKRQRMIEVQDELLRLE PQLKQLQTKYDELKERKSSLRNAAYFLSNLKQLYQDYSDVQAQ EPNVKETYDSSSLPALLFKARTLLGAESHLRNINHQLEKLLDQ G
643	1382	1167	755	VWVAMEEPPVREEE*EEGEEDEERDEVGPEGALGKSPFQLTAE DVYDISYLLGRELMALGSDPRVTQLQFKVVRVLEMLEALVNEG SLALEELKMERDHLRKEVEGLRRQSPPASGEWPDSTKRRPRRK KRKRCCGY

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644	1383	1	271	PRNDHRLTQSRRDSSSKTRAFLVPRFLPAHAGVTSEERTAMKR EGGAAHLCSDSLPESQQQDGNHAPNFSSHGSCRRRQRRRHDKA LHAR
645	1384	1	499	THASEKSRATMSSWSRQRPKSPGGIQPHVSRTLFLLLLLAASA WGVTLSPKDCQVFRSDHGSSISCQPPAEIPGYLPADTVHLAVE FFNLTHLPANLLQGASKLQELHLSSNGLESLSPEFLRPVPQLR VLDLTRNALTGLPPGLFQASATLDTLVLKENQLEVLE
646	1385	178	675	ERPRIMDLAGLLKSQFLCHLVFCYVFIASGLIINTIQLFTLLL WPINKQLFRKINCRLSYCISSQLVMLLEWWSGTECTIFTDPRA YLKYGKENAIVVLNHKF\EI\DFLCGWSLSERFGLLGVSQKCI PPCLTHFFGSAPPLVFLLLVIQNLQKNQQSFYLMKWS
647	1386	630	1499	MIVFGWAVFLASRSLGQGLLLTLEEHIAHFLGTGGAATTMGNS CICRDDSGTDDSVDTQQQQAENSAVPTADTRSQPRDPVRPPRR GRGPHEPRRKKQNVDGLVLDTLAVIRTLVDNDQEPPYSMITLH EMAETDEGWLDVVQSLIRVIPLEDPLGPAVITLLLDECPLPTK DALQKLTEILNLNGEVACQDSSHPAKHRNTSAVLGCLAEKLAG PASIGLLSPGILEYLLQCLLQSHPTVMLFALIALEKFAQTSEN KLTISESSISDRL\VTLESW\ANDPDYLKRQVG
648	1387	1	962	RFGTRGLAKSKGVVLMALCALTRALRSLNLAPPTVAAPAPSLF PAAQMMNNGLLQQPSALMLLPCRPVLTSVALNANFVSWKSRTK YTITPVKMRKSGGRDHTGRIRVHGIGGGHKQRYRMIDFLRFRP EETKSGPFEEKVIQVRYDPCRSADIALVAGGSRKRWIIATENM QAGDTILNSNHIGRMAVAAREGDAHPLGALPVGTLINNVESEP GRGAQYIRAAGTCGVLLRKVNGTAIIQLPSKRQMQVLETCVAT VGRVSNVDHNKRVIGKAGRNRWLGKRPNSGRWHRKGGWAGRKI RPLPPMKSYVKLPSASAQS
649	1388	291	714	PVQGARCWLDARRNVRVFSGVCCGCGIHGYWAEPCGGCGAMEG LRSSVELDPELTPGKLDEEMVGLPPHDASPQVTFHSLDGKTVV CPHFMGLLLGLLLLLTLSVRNQLCVRGERQLAETLHSQVKEKS QLIGKKTDCRD
650	1389	874	2220	GARGRPLAETWPFLTAPVLPGQLQITEPTMAEKGDCIASVYGY DLGGRFVDFQPLGFGVNGLVLSAVDSRACRKVAVKKIALSDAR SMKHALREIKIIRRLDHDNIVKVYEVLGPKGTDLQGELFKFSV AYIVQEYMETDLARLLEQGTLAEEHAKLFMYQLLRGLKYIHSA NVLHRDLKPANIFISTEDLVLKIGDFGLARIVDQHYS\HKGYL SEGLVTKWYRSPRLLLSPNNYTKAIDMWAAGCILAEMLTGRML FAGAHELEQMQLILETIPVIREEDKDELLRVMPSFVSSTWEVK RPLRKLLPEVNSEAIDFLEKILTFNPMDRLTAEMGLQHPYMSP YSCPEDEPTSQHPFRIEDEIDDIVLMAANQSQLSNWDTCSSRY PVSLSSDLEWRPDRCQDASEVQRDPRAGSAPLAENVQVDPRKD SHSSSASCQAGRNGVSRYQ

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651	1390	1	2451	MRTLGTCLATLAGLLLTAAGETFSGGCLFDEPYSTCGYSQSEG DDFNWEQVNTLTKPTSDPWMPSGSFMLVNASGRPEGQRAHLLL PQLKENDTHCIDFHYFVSSKSNSPPGLLNVYVKVNNGPLGNPI WNISGDPTRTWNRAELAISTFWPNFYQVIFEVITSGHQGYLAI DEVKVLGHPCTRTPHFLRIQNVEVNAGQFATFQCSAIGRTVAG DRLWLQGIDVRDAPLKEIKVTSSRRFIASFNVVNTTKRDAGKY RCMI\RTEGGVGISNYAEL\VVKEPPVPIAPPQLASVGATYLW IQLNANSINGDGPIVAREVEYCTASGSWNDRQPVDSTSYKIGH LDPDTEYEISVLLTRPGEGGTGSPGPALRTRTKCADPMRGPRK LEVVEVKSRQITIRWEPFGYNVTRCHSYNLTVHYCYQVGGQEQ VREEVSWDTENSHPQHTITNLSPYTNVSVKLILMNPEGRKESQ ELIVQTDEDLPGAVPTESIQGSTFEEKIFLQWREPTQTYGVIT LYEITYKAVSSFDPEIDLSNQSGRVSKLGNETHFLFFGLYPGT TYSFTIRASTAKGFGPPATNQFTTKISAPSMPAYELETPLNQT DNTVTVMLKPAHSRGAPVSVYQIVVEEERPRRTKKTTEILKCY PVPIHFQNASLLNSQYYFAAEFPADSLQAAQPFTIGDNKTYNG YWNTPLLPYKSYRIYFQAASRANGETKIDCVQVATKGAATPKP VPEPEKQTDHTVKIAGVIAGILLFVIIFLGVVLVMKKRLYKHG ASICSASGEASGSFQSWRKAKHKQACPMARAGARERAGGCLKL
652	1391	30	459	GIRQLLQLSRASMAARKSWTALRLCATVVVLDMVVCKGFVQDL DESFKENRNDDIWLVHFYAPWCGHCKKLEPIWNEAGLEMKSIG SPVKAGKMDATSYSSIASEFGVRGYPTIKLALIRPLPSQQMFE HMHKRHRVFFVYV
653	1392	168	1016	GLVIVISHFSPSPGLLPATQSPAMSDPITLNVGGKLYTTSLAT LTSFPDSMLGAMFSGKMPTKRDSQGNCFIDRDGKVFRYILNFL RTSHLDLPEDFQEMGLLRREADFYQVQPLIEALQEKEVELSKA EKNAMLNITLNQRVQTVHFTVREAPQIYSLSSSSMEVFNANIF STSCLFLKLLGSKLFYCSNGNLSSITSHLQDPNHLTLDWVANV EGLPEEEYTKQNLKRLWVVPANKQINSFQVFVEEVLKIALSDG FCIDSSHPHALDFMNNKIIRLIRY
654	1393	3	927	SCADNLVAASGGCWFVLGERRAGSLLSASYGTFAMPGMVLFGR RWAIASDDLVFPGFFELVVRVLWWIGILTLYLMHRGKLDCAGG ALLSSYLIVLMILLAVVICTVSAIMCVSMRGTICNPGPRKSMS KLLYIRLALFFPEMVWASLGAAWVADGVQCDRTVVNGIIATVV VSWIIIAATVVSIIIVFDPLGGKMAPYSSAGPSHLDSHDSSQL LNGLKTAATSVWETRIKLLCCCIGKDDHTRVAFSSTAELFSTY FSDTDLVPSDIAAGLALLHQQQDNIRNNQ\DLPRWSAMPQGAP RKLIWMQN
655	1394	1	716	FRAATAAAKGNGGGGGRAGAGDASGTRKKKGPGPLATAYLVIY NVVMTAGWLVIAVGLVRAYLAKGSYHSLYYSIEKPLKFFQTGA LLEILHCAIGIVPSSVVLTSFQVMSRVFLIWAVTHSVKEVQSE DSVL\FVIAWTITEIIRYSFYTFSLLNHLPYLIKRARYTLFIV LYPMGVSGELLTIYAALPFVRQAGLYSISLPNSTKKIFLISQV WWHMLAVSADAKAAEMPAVLKPGP

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656	1395	72	766	MLTGVGCLVSSESLSCVQCNSWEKSCVNSIASECPSHANTSCI SSSASSSLETPVRLYQNMFCSAENCSEETHITAFTVHVSAEEH FHFVSQCCEGKECSNTSDALDPPLKNVSSNAECPACYESNGTS CRGKPWKCYEEEQCVFLVAELKNDIESKSLVLKGCSNVSNATC QFLSGENKTLGGVIFRKFECANVNSLTPTSAPTTSHNVGSKAS LYLLALASLLLRGLLP
657	1396	97	746	VPARRRAMEIGTEISRKIRSAIKGKLQELGAYVDEELPDYIMV MVANKKSQDQMTEDLSLFLGNNTIRFTVWLHGVLDKLRSVTTE PSSLKSSDTNIFDSNVPSNKSNFSRGDERRHEAAVPPL\AIPS ARPEKRDSRVSTSSQESKTTNVRQTYDDGAATRLMSTV/KPLR EPAPSEDVIDIKPEPDDLIDEDLNFVQEKPLSQKKPTVTLTYG SSR
658	1397	155	560	ASRVLAAVMGLPWGQPHLGLQMLLLALNWLRPSLSLELVPYTP QITAWDLEGKVTATTFSLEQPRCVFDGLASASDTVWLVVAFSN ASRGFQNPETLADIPASPQLLTDGHYMTLPLSPDQLPCGDPMA GSGSAP
659	1398	416	539	NSLNNFFFETESCCVAQAGVQWRDLGSLQAPPPGFKRFSCL
660	1399	281	736	KSLPLQKHPKPSCQEDQGLGRGSLSGHSPLTLLTFLTSCALGD QQLLPPRTSGSLCQESMSEQSCQMSELRLLLLGKCRSGKSATG NAILGKHVFKSKFSDQTVIKMCQRESWVLRERKVVVIDTPDLF SSIACAEDKQRNIQHLLELSAP
661	1400	2	974	FVETTVSVQSAESSDALSWSRLPRALASVGPEEARSGAPVGGG RWQLSDRVEGGSPTLGLLGGSPSAQPGTGNVEAGIPSGRMLEP LPCWDAAKDLKEPQCPPGDRVGVQPGNSRVWQGTMEKAGLAWT RGTGVQSEGTWESQRQDSDALPSPELLPQDQDKPFLRKACSPS NIPAVIITDMGTQEDGALEETQGSPRGNLPLRKLSSSSASSTG FSSSYEDSEEDISSDPERTLDPNSAFLHTLDQQKPRVVESRSV TQAGVQWHDIGSLQPLPP/WIQAIL/HASAFRIAGTTGACHHA RIIFGFLVERGFHHVGQDGLYLLIL
662	1401	232	3	KICSSYFLRIICILQKEAQEASNLYTSCDFFSPAFYFVIYRLY NFKIHWPGAVAHTYSPSTLGGRGRWVT*GREFM
663	1402	250	556	LILSLPLLYGHLKSYTFPSEHYLHLLQTFATFNKYLNVCVLIF IHHKPVVPAIQGTNVGGSLEPRRLRLQQAMIVPLHFGLGNRVR PCLKKQQQQQQQQKK
664	1403	1	373	RMETKPVITCLKTLLIIYSFVFWITGVILLAAGVWGKLTLGSY ISLIAENSTYAPYVLIVTGTTIVAYPLV*FFFSYSSGFSYILA VRLIAGIALVYNYIPRSSSRALVRLVVLLRFLLSRHPS
665	1404	3	413	NAEHPGMDRHDLCQKAKLAEHAERDDDMAACMKTVTDQGAELS NEERNLLSDAHTNAV*ARRSSWMGA*RIEQKTEGADTQQQMAP DCREIFATELRDICDDVLSLLEKLLIPNASHA*SLVYYLHMIG DYYRYWL
666	1405	2	334	GGGPLGKMPRAQLADPWQMMAVESPSDCADNGQQIMDEPMGED EISPQTE*VSIKEVAVTHCVKEGHDKADPSQIELLRVLRQGSL GKVYLGKKVSGSDAKQLYAMKVLT

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667	1406	2	332	DAAGIRHEAHFGKLECLVQLVRAGA\SLFVSTTRYAQTPA\HI AAFGGHPQCLVWLIQAGANINKPDCEGETPIHKAARSGSLECI SALVANGAHVDNPKKGIRVLEWLFE \
668	1407	242	1157	LLKLMFIAELGDYDLAEHSPELVSEFRFVPIQTEEMELAIFEK WKEYRGQTPAQAETNYLNKAKWLEMYGVDMHVVKARDGNDYSL GLTPTGVLVFEGDTKIGLFFWPKITRLDFKKNKLTLVVVEDDD QGKEQEHTFVFRLDHPKACKHLWKCAVEHHAFFRLRGPVQKSS HRSGFIRLGSRFRYSGKTEYQTTKTNKARRSTSFERRPSKRYS RRTLQMKACATKPEELSVHNNVSTQSNGSQQAWGMRSALPVSP SISSAPVPVEIENLPQSPGTDQHDRKWLSAASDCCQRGGNQWN TRAL
669	1408	278	1	ATAPGLFNFF*FLFQCREEHKKKNPEVPVNFAEFSKKCSGRWK TMSSKEKFKFGEMAKADEVCYDREMKDYGPAKGGKKKDPNAPK RPPSGF
670	1409	139	646	AEGLGSWAVWAGLGWAGRHMEAGGATGALGVGSKLPSAFCFPG SSVAMDMFQKVEKIGEGTYGVVYKAKNRETGQLVALKKIRLDL *VLGRPLSYPPWAITTWALPDPFPLSWSPRLTPLGAAQQPLPV LSPVHCLLTSLCRGPDCGVWWMTCQGAQVSIAGALVILWG
671	1410	3	442	LCVSVLCSFSYLQNGWTASDPVHGYWFR\AGDHVSRNIPVATN NPVRAVQEETRDRFHLLGDPQNKDCTLSIRDTRESDAGTYVFC VERGNMKWNYKYDQLSVNVTASQDLLSRYRLEVPESVTVQEGL CVSVP/WQCPLPPLQLDCL
672	1411	84	836	QLQLCQNCTKRGECHCVPFDTYIKTKKEKKRLSVLPPTRLMEA RFSPINQILPWCRQDLAISISKAINTQEAPVKEKHARRIILGT HHEKGAFTFWSYAIGLPLPSSSILSWKFCHVLHKVLRDGHPNV LHDCQRYRSNIREIGDLWGHLHDRYGQLVNVYTKLLLTKISFH LKHPQFPAGLEVTDEVLEKAAGTDVNNM*VTLHGYMASSPRLP HSFLPRLTPRRPHGAVGLNESVALLVDAHAPRDRG
673	1412	307	664	AAPHRMPRAPHFMPLLLLLLLLSLPHTQAAFPQDPLPLLISDL QGTSPLSWLPSLEDDAVAA*LGLDFQRFLTLNRTLLVAARDHV FSFDLQAEEEGEGLVPNKYLTWRSQDVENCAVR*KLTLNRTLL VAARDHVFSFDLQAEEEGEGLVPNKYLTWRSQDVENCAVR
674	1413	24	420	HLVPKTRGRGTPSGDQSPVLTLTP*GDPPTILGPQTNQPKEHL TNFKSGKRSFHSLLQPLLLLLLHPSISPFLNFGSFPPFLVETEET CFIHKLKTPALVTPDSLPLVFNHCGDACLIIHPHFRDVEFHHT GN

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675	1414	1	1101	CCSTKNISGDKACNLMIFDTRKTARQPNCYLFFCPNEEACPLK PAKGLMSYRIITDFPSLTRNLPSQELPQEDSLLHGQFSQAVTP ·LAHHHTDYSKPTDISWRDTLSQKFGSSDHLEKLFKMDEASAQL LAYKEKGHSQSSQFSSDQEIAHLLPENVSALPATVAVASPHTT SATPKPATLL\PTNASVTPSGTSQPQLA\TTAPPVTTVTSQPP TTLISTVFTRAAATLQAMATTAVLTTTFQAPTDSKGSLETIPF TEISNLTLNTGNVYNPTALSMSNVESSTMNKTASWEGREASPG SSSQGSVPENQYGLPFEKWLLIGSLLFGVLFLVIGLVLLGRIL SESLRRKRYSRLDYLINGIYVDI
676	1415	178	621	IFAGSGVMRLKISLLKEPKHQELVSCVGWTTAEELYSCSDDHH IVKWNLLTSETTQIVKLPDDIYPIDFHWFPKSLGVKKQTHAES FVLTSSDGKFHLISKLGRVEKSVEAHCGAVLAGRWNYEGTALV TVGEDGQI*IWSKTGMLIS
677	1416	1258	944	ARATTKRHFILLFLFFLRRC\LFLSPRMECNGAILAHCNLHLP GSSSSSASAS*VAGITDVRHHAQLILFVFLVETGFHRVGQAGL KLLTSGDLLTSASQSAGIIMGISHCAQPKKAF*TKTF
678	1417	876	1291	EAGSNDDLAT*KTCGRARPSSRSRQFGSRVWNHRQGVRSSPGE GAGSRSPCRRRHRRKHRRNVQSP*RRRSRSCSRRSGRCSVALL GACPVAGHSRGKVVCRRAHAITQRRRCCGFDPMVHPKEHRG*R ERSRKWSRS
679	1418	262	539	ATAPGLFNFF*FLFQCREEHKKKNPEVPVNPAEFSKKCSGRWK TMSSKEKFKFGEMAKADEVCYDREMKDYGPAKGGKKKDPNAPK RPPSGF
680	1419	104	236·	LTVNYVLVFSRDSGLRAIENLMQKKGKFDYILLETTGLADPGK K
681	1420	3	277	HEAALCRTRAVAAERHFLRVFLFFRPFRGVGTESGSESGSSKA KEPRTPSSSYGTAQYRRWPIAQEYKHCTAHNDTGTLCSELREP WRRPQ
682	1421	3	576	EGSSQANTLRSRKENRNNLLACLESHVLR*QFTESHLCSLMGD NPFQPKSNSKMAELFMECEEEELEPWQKKVKEVEDDDDDEPIF VGEISSSKPAISNILNRVNPSSYSRGLKNGALSRGITAAFKPT SQHYTNPTSNPVPASPINFHPESRSSDSSVIGQPFSKPVSVSK TIRPAQGSIGCCLSISTV
683	1422	6	627	CFSLEDILNFFLQGFSAGLFAFYHDKDGNPLTSRFADGLPPFN YSLGLYQWSDKVVRKVERLWDVRDNKIVRHTVYLLVTPRVVEE ARKHFDCPVLEGMELENQGGVGTELNHWEKRLLENEAMTGSHT QNRVLSRITLALMEDTGRQMLSPYCDTLRSNPLQLTCRQDQRA VAV\CNLQKFPKPLPQEYQYFDELSGIPAEDLPYYG
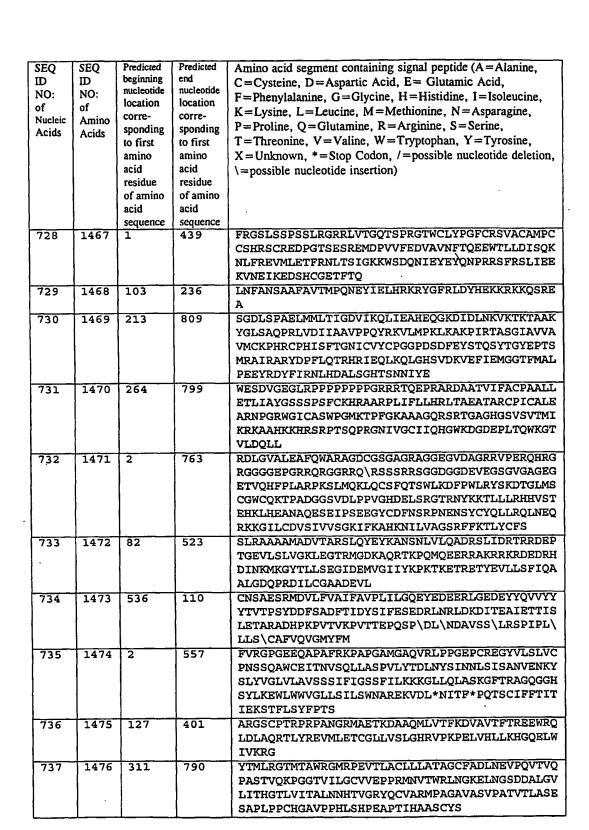
SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corre- sponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corre- sponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A = Alanine, C = Cysteine, D = Aspartic Acid, E = Glutamic Acid, F = Phenylalanine, G = Glycine, H = Histidine, I = Isoleucine, K = Lysine, L = Leucine, M = Methionine, N = Asparagine, P = Proline, Q = Glutamine, R = Arginine, S = Serine, T = Threonine, V = Valine, W = Tryptophan, Y = Tyrosine, X = Unknown, * = Stop Codon, / = possible nucleotide deletion, \ = possible nucleotide insertion)
684	1423	1	1272	AARRRRQLVSRRRTAE\YPRRRRSSPSARPPDVPGQQPKAAKS PSPVQGKKSPRLLCIEKVTTDKDPKEEKEEEDDSALPQEVSIA ASRPSRGWRSSRTSVSRHRDTENTRSSRSKTGSLQLICKSEPN TDQLDYDVGEEHQSPGGISSEEEEEEEEEMLISEEEIPFKDDP RDETYKPHLERETPKPRRKSGKVKEEKEKKEIKVEVEVEVKEE ENEIREDEEPPRKRGRRRKDDKSPRLPKRRKKPPIQYVRCEME GCGTVLAHPRYLQHHIKYQHLLKKKYVCPHPSCGRLFRLQKQL LRHAKHHTDQRDYICEYCARAFKSSHNLAVHRMIHTGEKPLQC EICGFTCRQKASLNWHMKKHDADSFYQFSCNICGKKFEKKDSV VAHKAKSHPEVLIAEALAANAGALITSTDILGTNPES
685	1424	56	526	MTANRLAESLLALSQQEELADLPKDYLLSESEDEGDNDGERKH QKLLEAISSLDGKNRRKLAERSEASLKVSEFNVSSEGSGEKLV LADLLEPVKTSSSLATVKKQLSRVKSKKTVELPLNKEEIERIH REVAFNKTAQVLSKWDPVVLKNRQAEQL*
686	1425	132	344	RIDFMFHSSAMVNSHRKPMFNIHRGFYCLTAILPQICICSQFS VPSSYHFTEDPGAFPVATNGERFPWQELRLPSVVIPLHYDLFV HPNLTSLDFVASEKIEVLVSNATQLIILHSKDLEITNATLQSE EDSRYMKPGKELKVLSYPAHEQIALLVPEKLTPHLKYYVAMDF QAKLGDGFEGFYKSTYRTLGGETRILAVTDFEPTQARMAFPCF DEPLFKANFSIKIRRESRHIALSNMPKVKTIELEGGLLEDHFE TTVKMSTYLVAYI/DL*FPLMGNDFLGRS
687	1426	3	678	RSKIPRSDPRVRTPAPAEAEQGKSQCPSGSTAQSWSAMDILVP LLQLLVLLLTLPLHLMALLGCWQPLCKSYFPYLMAVLTPKSNR KMESKKRELFSQIKGLTGASGKVALLELGCGTGANFQFYPPGC RVTCLDPNPHFEKFLTKSMAENRHLQYERFVVAPGEDMRQLAD GSMDVVVCTLVLCSVQSPRKVLQEVRRVLRPGGVLFFWEHVAE PYGSWAFMW
688	1427	240	641	RLQNSSLMDPKLGRMAASLLAVLLLLLLERGMFSSPSPPPALL EKVFQYIDLHQDEFVQTLKEWVAIESDSVQPVPRFRQELFRMM AVAADTLQRLGARVASVDMGPQQLPDGQSLPIPPVILAELGSD PTKG
689	1428	1	116	FFFFEMESCSVTQAGVPWHDLSSLQPPPPRFKRFSCLS
690	1429	75	511	DPKAQLPEPLRVLWTAHLVAMAPGSRTSLLLAFALLCLPWLQE AGAVQTVPLSRLFDHAMLQAHRAHQLAIDTYQEFEETYIPKDQ KYSFLHDSQTSFCFSDSIPTPSNMEETQQKSNLELLRISLLLI ESWLEPVRILMSIVPN

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691	1430	2	1364	FVKLIKKHQAAMEKEAKVMSNEEKKFQQHIQAQQKKELNSFLE SQKREYKLRKEQLKEELNENQSTPKKEKQEWLSKQKENIQHFQ AEEEANLLRRQRQYLELECRRFKRRMLLGRHNLEQDLVREELN KRQTQKDLEHAMLLRQHESMQELEFRHLNTIQKMRCELIRLQH QTELTNQLEYNKRRERELRRKHVMEVRQQPKSLKSKELQIKKQ FQDTCKIQTRQYKALRNHLLETTPKSEHKAVLKRLKEEQTRKL AILAEQYDHSINEMLSTQALRLDEAQEAECQVLKMQLQQELEL LNAYQSKIKMQAEAQHDRELRELEQRVSLRRALLEQKIEEEML ALQNERTERIRSLLERQAREIEAFDSESMRLGFSNMVLSNLSP EAFSHSYPGASGWSHNPTGGPGPHWGHPMGGPPQAWGHPMQGG PQPWGHPS\GPMQ\GVPR/GSSMGVR
692	1431	50	504	LAHGSFGVSDFPAPAAAPAHTLTSFSGSLSPQFRKPLGRAPAM PLVRYRKVVILGYRCVGKTSLAHQFVEGEFSEGYDPTVENTYS KIVTLGKDEFHLHLVDTAGQDEYSILPYSFIIGVHGYVLVYSV TSLHSFQVIESLYQKLHEGHGK
693	1432	130	1671	SSPSRELCFYGFWIASSWWSRWVGSLGPGILPSPPARGRTFAS VSRLPPPWSAGITLTPFLICQSGSVCPGLGAGFGVRSFHHPVA RSAVLLLPLAPAAAQDSTQASTPGSPLSPTEYERFFALLTPTW KAETTCRLRATHGCRNPTLVQLDQYENHGLVPDGAVCSNLPYA SWFESFCQFTHYRCSNHVYYAKRVLCSQPVSILSPNTLKEIEA SAEVSPTTMTSPISPHFTVTERQTFQPWPERLSNNVEELLQSS LSLGGQEQAPEHKQEQGVEHRQEPTQEHKQEEGQKQEEQEEEQ EEEGKQEEGQGTKEGREAVSQLQTDSEPKFHSESLSSNPSSFA PRVREVESTPMIMENIQELIRSAQEIDEMNEIYDENSYWRNQN PGSLLQLPHTEALLVLCYSIVENTCIITPTAKAWKYMEEEILG FGKSVCDSLGRRHMSTCALCDFCSLKLEQCHSEASLQRQQCDT SHKTPFVSPLLASQSLSIGNQVGSPESGRFYGLDLYGGLHM
694	1433	517	578	VSWVPSKDGDVEGARRPFTRLNTSLGPGLQEGRRRTWLVPIPG AVLPGRTQEQPRASPLY*PGAPPCQPQGLVAGPWAQ*AGLRSD GFGPWPW\RLVGTAGPREKKVQKSKCWHFRCGRHPARRSGWAG RHASLLATGRPCSSAPSQQPLGTAGDSRQELLRPPLV*VNGAQ SSAAGDWGSSPRTAQALARPHRLGHHPAAVAPAARLRTQSGHS PRGPLCRSPGSPRRMGTWRGPAGHSHD
695	1434	249	632	KTVAEEASVGNPEGAFMKMLQARKQHMSTELTIESEAPSDSSG INLSGFGSEQLDTNDESDVSSALSYILPYLSLRNLGAESILLP FTEQLFSNVQDGDRLLSILKNNRKSPSQSSLLGNKFKNKIF
696	1435	333	881	GECFIMAAVVQQNDLVFEFASNVMEDERQLGDPAIFPAVIVEH VPGADILNSYAGLACVEEPNDMITESSLDVAEEEIIDDDDDDI TLTVEASCHDGDETIETIEAAEALLNMDSPGPMLDEKRINNNI FSSPEDDMVVAPVTHVSVTLDGIPEVMETQQVQEKYADSPGAS SPEQPKRKKK

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697	1436	3	466	HEASGVSRALLQSAPGTPATVGISVGELWPFARCCSHSYVRSL RGLSVSTHLLCFTIYIMNPSMKQKQEEIKENIKTSSVPRRTLK MIQPSASGSLVGRENELSAGLSKRKHRNDHLTSTTSSPGVIVP ESSENKNLGGVTQESFDLMIKGMKK
698	1437	50	241	PLPARGKSTLPATFCSPSAPELASMSVVPPNRSQTGWPRGVTQ FGNKYIQQTKPLTLERTINL
699	1438	1	422	AEGEDVPPLPTSSGDGWEKDLEEALEAGGCDLETLRNIIQGRP LPADLRAKVWKIALNVAGKGDSLASWDGILDLPEQNTIHKDCL QFIDQLSVPEEKAAELLLDIESVITFYCKSRNIKYSTSLSWIH LLKPLVHLQLP
700	1439	161	413	ALPKFLTHGVKSNERVVVWLFPPSFRAATMVHMNVLPDALKSI NNAERRGKPQVLIRLCSKIIIWFLTVMVKYGYIGKFEPTRP
701	1440	211	977	AMAQYGHPSPLGMAAREELYSKVTPRRNRQQRPGTIKHGSALD VLLSMGFPRARAQKALASTGGRSVQAACDWLFSHVGDPFLDDP LPREYVLYLRPTGPLAQKLSDFWQQSKQICGKNKAHNIFPHIT LCQFFMCEDSKVDALGEALQTTVSRWKCKFSAPLPLELYTSSN FIGLFVKEDSAEVLKKFAADFAAEAASKTEVHVEPHKKQLHVT LAYHFQASHLPTLEKLAQNIDVKLGCDWVATIFSRDIRFA
702	1441	3	408	QTRPASPRTARESVLGVSQNMSFNLQSSKKLFIFLGKSLFSLL EAMIFALLPKPRKNVAGEIVLITGAGSGLGRLLALQFARLGSV LVLWDINKEGNEETCKMAREAGATRVHAYTCDCSQKEGVYRVA DQVKK
703	1442	708	244	MVARKGQKSPRFRRVTCFLRLGRSTLLELEPAGRPCSGRTRHR ALHRRLVACVTVSSRRHRKEAGRGRAESFIAVGMAAPSMKERQ VCWGARDEYWKCLDENLEDASQCKKLRSSFESSCPQQWIKYFD KRRDYLKFKEKFEAGQFEPSETTAKS
704	1443	3	475	PAPAARSRELLKELRNGQDMDTVVFEDVVVDFTLEEWALLNPA QRKLYRDVMLETFKHLASVDNEAQLKASGSISQQDTSGEKLSL KQKIEKFTRKNIWASLLGKNWEEHSVKDKHNTKERHLSRNPRV ERPCKSSKGNKRGRTFRKTRNCNRHLRR
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706	1445	2	322	GTRLRRRREAVWFEVVNMDFSRLHMYSPPQCVPENTGYTYALS SSYSSDALDFETEHKLDPVFDSPRMSRRSLRLATTACTLGDGE AVGADSGTSSAVSLKNRAAR
707	1446	123	410	DTMQAVVPLNKMTAISPEPQTLASTEQNEVPRVVTSGEQEAIL RGNAADAESFRQRFRWFCYSEVAGPRKALSQLWELCNQWLRPD IHTKE\QILE
708	1447	2	384	PICLFSRPTLRPSRSKVSLIEGRGANMAARWRFWCVSVTMVVA LLIVCDVPSASAQRKKEMVLSEKVSQLMEWTNKRPVIRMNGDK FRRLVKAPPRNYSVIVMFTALQLHRQCVVCKYELQLRFKIK

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
709	1448	104	535	QMRVKDPTKALPEKAKRSKRPTVPHDEDSSDDIAVGLTCQHVS HAISVNHVKRAIAENLWSVCSECLKERRFYDGQLVLTSDIWLC LKCGFQGCGKNSESQHSLKHFKSSRTEPHCIIINLSTWIIWWY EWDEKIFTPLNKKG
710	1449	116	479	AKERGEERQGEGGGWLSGSRWPLVRSAFVPAPSSLILSMCLSP GIPEAAPDSPLTASAPTP*VMLLGDTGVGKTCFLIQFKDGAFL SGTFIATVGIDFRVRWLQALASSREPGLWLRHGGV
711	1450	2	232	FYPRSSADLPFQTTRCEFQTSVMELAHSLLLNEEALAQITEAK RPVFIFEWLRFLDKVLVAANKVWYCSFFPVALT
712	1451	105	393	MNMKQKSVYQQTKALLCKNFLKKWRMKRESLLEWGLSILLGLC IALFSSSMRNVQFPGMAPQNLGRVDKFNSSSLMVVYTPISNLT QQIMNKTAL
713	1452	2	525	SPQGNGCPDVTGDSVIRVPLTLLVHNLAGLTGLLHHCLSGPLP APSPPPAMSSSRKDHLGASSSEPLPVIIVGNGPSGICLSYLLS GYTPYTKPDAIHPHPLLQRKLTEAPGVSILDQDLDYLSEGLEG RSQSPVALLFDALLRPDTDFGGNMKSVLTWKHRKEHAIPHVVL GR
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715	1454	319	873	LCIMDTKEEKKERKQSYFARLKKKKQAKQNAETASAVATRTHT GKEDNNTVVLEPDKCNIAVEEEYMTDEKKKRKSNQLKEIRRTE LKRYYSIDDNQNKTHDKKEKKMVVQKPHGTMEYTAGNQDTLNS IALKFNITPNKLVELNKLFTHTIVPGQVLFVPDANSPSSTLRL SSSSPGATVSPSS
716	1455	60	681	SAGGDSCRAVPMLRFPTCFPSFRVVGEKQLPQEIIFLVWSPKR DLIALANTAGEVLLHRLASFHRVWSFPPNENTGKEVTCLAWRP DGKLLAFALADTKKIVLCDVEKPESLHSFSVEAPVSCMHWMEV TVESSVLTSFYNAEDESNLLLPKLPTLPKNYSNTSKIFSEENS DEIIKLLGDVRLNILVLGGSSGFIELYAYGMFKI
717	1456	357	658	PRDPVTDRARAMPRRGLVAGPDLEYFQRHYFTPAEVAQHNRPE DLWVSYLGRVYDLTSLAQEYKGNLLLKPIVEVAGQDISHWFDP KTRDVSYAGTWDCG

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
718	1457	2	481	RIPGRRFRAAFVLGSANVASSVRLRCSFPLSLGGPSGPAAASV ALGPAGPGRSLGRTPDTGDWEMDSVSFEDVAVAFTQEEWALLD PSQKNLYRDVMQEIFRNLASVGNKSEDQNIQDDFKNPGRNLSS HVVERLFEIKEGSQYGETFSQDSNLNLNKI
719	1458	6	469	SLSLSVSPFLRLSLGRVGGMAEEMESSLEASFSSSGAVSGASG FLPPARSRIFKIIVIGDSNVGKTCLTYRFCAGRFPDRTEATIG VDFRERAVEIDGERIKIQLWDTAGQERFRKSMVQHYYRNVHAV VFVYDMTNMASFHSLPSWIEECKQH
720	1459	82	490	RRPSPGSIVIMAAESDVLHFQFEQQGDVVLQKMNLLRQQNLFC DVSIYINDTEFQGHKVILAACSTFMRDQFLLTQSKHVRITILQ SAEVGRKLLLSCYTGALEVKRKELLKYLTAASYLQMVHIAEKR TEAFVKF
721	1460	48	708	AEGLQSAAGIRIDTKAGPPEMLKPLWKAAVAPTWPCSMPPRRP WDRQAGTLQVLGALAVLWLGSVALICLLWQVPRPPTWGQVQPK DVPRSWEHGSSPAWEPLEAEARQQRDSCQLVLVESIPQDLPSA AGSPSAQPLGQAWLQLLDTAQESVHVASYYWSLTGPDIGVNDS SSQLGEALLQKLQQLLGRNISLAVATSSPTLARTSTDLQVLAA RGAH
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723	1462	45	569	LQPLSSWESASEVTRSPVSPEDVKQATSNFENLQKQLARKMKL PIFIADAFTARAFRGNPAAVCLLENELDEDMHQKIAREMNLSE TAFIRKLHPTDNFAQSSCFGLRWFTPASEVPLCGHATLASAAV LFHKIKNMNSTLTFVTLSGELRARRAEDGIVLDLPLYPAHPQD FHE*
724	1463	79	530	AADTMQSDDVIWDTLGNKQFCSFKIRTKTQSFCRNEYSLTGLC NRSSCPLANSQYATIKEEKGQCYLYMKVIERAAFPRRLWERVR LSKNYEKALEQIDENLIYWPRFIRHKCKQRFTKITQYLIRIRK LTLKRQRKLVPLSKKVERREK
725	1464	2	261	FVERGLGDPALPTLMFEEPEWAEAAPVAAGLGPVISRPPPAAS SQNKVSDSREQWELFQAAKRTLVDPSAVCIAGRDTCGTVKGES
726	1465	1	860	VVEFLWSRRPSGSSDPRPRRPASKCQMMEERANLMHMMKLSIK VLLQSALSLGRSLDADHAPLQQFFVVMEHCLKHGLKVKKSFIG QNKSFFGPLELVEKLCPEASDIATSVRNLPELKTAVGRGRAWL YLALMQKKLADYLKVLIDNKHLLSEFYEPEALMMEEEGMVIVG LLVGLNVLDANL\CLKGEDLDSQVGVIDFSLYLKDVQDLDGGK EHERITDVLDQKNYVEELNRHLSCTVGDLQTKIDGLEKTNSKL QERVSAATDRICSLQEEQQQLREQNELIR
727	1466	69	452	GCYAPSPHLGGSLTPRFFPNGVFHRRLPRPRPPQPPSVSSAPT LRPLCAHFSLGKLRLRVRKSAEVAPPRTEKGWGSAEPRHSRAP LGLQGLRMAASAQVSVTFEDVAVTFTQEEWGQLDAAQRTLY

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A=Alanine, C=Cysteine, D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine, I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline, Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan, Y=Tyrosine, X=Unknown, *=Stop Codon, /=possible nucleotide deletion, \=possible nucleotide insertion)
728	1467	1	439	FRGSLSSPSSLRGRRLVTGQTSPRGTWCLYPGFCRSVACAMPC CSHRSCREDPGTSESREMDPVVFEDVAVNFTQEEWTLLDISQK NLFREVMLETFRNLTSIGKKWSDQNIEYEYQNPRRSFRSLIEE KVNEIKEDSHCGETFTQ
729	1468	103	236	LNFANSAAFAVTMPQNEYIELHRKRYGFRLDYHEKKRKKQSRE A
730	1469	213	809	SGDLSPAELMMLTIGDVIKQLIEAHEQGKDIDLNKVKTKTAAK YGLSAQPRLVDIIAAVPPQYRKVLMPKLKAKPIRTASGIAVVA VMCKPHRCPHISFTGNICVYCPGGPDSDFEYSTQSYTGYEPTS MRAIRARYDPFLQTRHRIEQLKQLGHSVDKVEFIEMGGTFMAL PEEYRDYFIRNLHDALSGHTSNNIYE
731	1470	264	799	WESDVGEGLRPPPPPPPPPGRRRTQEPRARDAATVIFACPAALL ETLIAYGSSSPSFCKHRAARPLIFLLHRLTAEATARCPICALE ARNPGRWGICASWPGMKTPFGKAAAGQRSRTGAGHGSVSVTMI KRKAAHKKHRSRPTSQPRGNIVGCIIQHGWKDGDEPLTQWKGT VLDQLL
732	1471	2	763	RDLGVALEAFQWARAGDCGSGAGRAGGEGVDAGRRVPERQHRG RGGGGEPGRRQRGGRRQ\RSSSRRSGGDGGDEVEGSGVGAGEG ETVQHFPLARPKSLMQKLQCSFQTSWLKDFPWLRYSKDTGLMS CGWCQKTPADGGSVDLPPVGHDELSRGTRNYKKTLLLRHHVST EHKLHEANAQESEIPSEEGYCDFNSRPNENSYCYQLLRQLNEQ RKKGILCDVSIVVSGKIFKAHKNILVAGSRFFKTLYCFS
733	1472	82	523	SLRAAAMADVTARSLQYEYKANSNLVLQADRSLIDRTRRDEP TGEVLSLVGKLEGTRMGDKAQRTKPQMQEERRAKRRKRDEDRH DINKMKGYTLLSEGIDEMVGIIYKPKTKETRETYEVLLSFIQA ALGDQPRDILCGAADEVL
734	1473	536	110	CNSAESRMDVLFVAIFAVPLILGQEYEDEERLGEDEYYQVVYY YTVTPSYDDFSADFTIDYSIFESEDRLNRLDKDITEAIETTIS LETARADHPKPVTVKPVTTEPQSP\DL\NDAVSS\LRSPIPL\ LLS\CAFVQVGMYFM
735	1474	2	557	FVRGPGEEQAPAFRKPAPGAMGAQVRLPPGEPCREGYVLSLVC PNSSQAWCEITNVSQLLASPVLYTDLNYSINNLSISANVENKY SLYVGLVLAVSSSIFIGSSFILKKKGLLQLASKGFTRAGQGGH SYLKEWLWWVGLLSILSWNAREKVDL*NITF*PQTSCIFFTIT IEKSTFLSYFPTS
736	1475	127	401	ARGSCPTRPRPANGRMAETKDAAQMLVTFKDVAVTFTREEWRQ LDLAQRTLYREVMLETCGLLVSLGHRVPKPELVHLLKHGQELW IVKRG
737	1476	311	790	YTMLRGTMTAWRGMRPEVTLACLLLATAGCFADLNEVPQVTVQ PASTVQKPGGTVILGCVVEPPRMNVTWRLNGKELNGSDDALGV LITHGTLVITALNNHTVGRYQCVARMPAGAVASVPATVTLASE SAPLPPCHGAVPPHLSHPEAPTIHAASCYS

SEQ ID NO: of Nucleic Acids	SEQ ID NO: of Amino Acids	Predicted beginning nucleotide location corresponding to first amino acid residue of amino acid sequence	Predicted end nucleotide location corresponding to first amino acid residue of amino acid sequence	Amino acid segment containing signal peptide (A = Alanine, C = Cysteine, D = Aspartic Acid, E = Glutamic Acid, F = Phenylalanine, G = Glycine, H = Histidine, I = Isoleucine, K = Lysine, L = Leucine, M = Methionine, N = Asparagine, P = Proline, Q = Glutamine, R = Arginine, S = Serine, T = Threonine, V = Valine, W = Tryptophan, Y = Tyrosine, X = Unknown, * = Stop Codon, / = possible nucleotide deletion, \ = possible nucleotide insertion)
738	1477	2	421	WGRRRQLVSEAARAQGDPVCSTMSEEEAAQIPRSSVWEQDQQN VVQRVVALPLVRATCTAVCDVYSAAKDRHPLLGSACRLAENCV CGLTTRALDHAQPLLEHLQPQLATMNSLACRGLDKLEEKLPFL QQPSETVVTS
739	1478	256	1250	AKAFTMAESPGCCSVWARCLHCLYSCHWRKCPRERMQTSKCDC IWFGLLFLTFLLSLSWLYIGLVLLNDLHNFNEFLFRRWGHWMD WSLAFLLVISLLGTYASLLLVLALLLRLCRQPLHLHSLHKVLL LLIMLLVAAGLVGLDIQWQQERHSLRVSL/QDCR*L*TPAVRP *EESGEGHWRRAHLTSSCPQATAPFLHIGAAAGIALLAWPVAD TFYRIHRREPKILLLLLFFGVVLVIYLAPLCISSPCIMEPRDL PPKPGLVGHRGAPMLAPENTLMSLRKTAECGATVFETDVMVSS DGVPFLMHDEHLSRTTNVASVFPTRITAHSS

WHAT IS CLAIMED IS:

1.   An isolated polynucleotide comprising a nucleotide sequence selected from the group consisting of SEQ ID NO: 1-739, a mature protein coding portion of SEQ ID NO:1-739, an active domain of SEQ ID NO: 1-739, and complementary sequences thereof.

2.   An isolated polynucleotide encoding a polypeptide with biological activity, wherein said polynucleotide hybridizes to the polynucleotide of claim 1 under stringent hybridization conditions.

3.   An isolated polynucleotide encoding a polypeptide with biological activity, wherein said polynucleotide has greater than about 90% sequence identity with the polynucleotide of claim 1.

4.   The polynucleotide of claim 1 wherein said polynucleotide is DNA.

5.   An isolated polynucleotide of claim 1 wherein said polynucleotide comprises the complementary sequences.

6.   A vector comprising the polynucleotide of claim 1.

7.   An expression vector comprising the polynucleotide of claim 1.

8.   A host cell genetically engineered to comprise the polynucleotide of claim 1.

9.   A host cell genetically engineered to comprise the polynucleotide of claim 1 operatively associated with a regulatory sequence that modulates expression of the polynucleotide in the host cell.

10.   An isolated polypeptide, wherein the polypeptide is selected from the group consisting of:

(a)   a polypeptide encoded by any one of the polynucleotides of claim 1; and

(b)   a polypeptide encoded by a polynucleotide hybridizing under stringent conditions with any one of SEQ ID NO:1-739.

11.   A composition comprising the polypeptide of claim 10 and a carrier.

12.   An antibody directed against the polypeptide of claim 10.

13.   A method for detecting the polynucleotide of claim 1 in a sample, comprising:

        a)   contacting the sample with a compound that binds to and forms a complex with the polynucleotide of claim 1 for a period sufficient to form the complex; and

        b)   detecting the complex, so that if a complex is detected, the polynucleotide of claim 1 is detected.

14.   A method for detecting the polynucleotide of claim 1 in a sample, comprising:

        a)   contacting the sample under stringent hybridization conditions with nucleic acid primers that anneal to the polynucleotide of claim 1 under such conditions;

        b)   amplifying a product comprising at least a portion of the polynucleotide of claim 1; and

        c)   detecting said product and thereby the polynucleotide of claim 1 in the sample.

15.   The method of claim 14, wherein the polynucleotide is an RNA molecule and the method further comprises reverse transcribing an annealed RNA molecule into a cDNA polynucleotide.

16.   A method for detecting the polypeptide of claim 10 in a sample, comprising:

a)   contacting the sample with a compound that binds to and forms a complex with the polypeptide under conditions and for a period sufficient to form the complex; and

b)   detecting formation of the complex, so that if a complex formation is detected, the polypeptide of claim 10 is detected.

17.   A method for identifying a compound that binds to the polypeptide of claim 10, comprising:

a)   contacting the compound with the polypeptide of claim 10 under conditions sufficient to form a polypeptide/compound complex; and

b)   detecting the complex, so that if the polypeptide/compound complex is detected, a compound that binds to the polypeptide of claim 10 is identified.

18.   A method for identifying a compound that binds to the polypeptide of claim 10, comprising:

a)   contacting the compound with the polypeptide of claim 10, in a cell, under conditions sufficient to form a polypeptide/compound complex, wherein the complex drives expression of a reporter gene sequence in the cell; and

b)   detecting the complex by detecting reporter gene sequence expression, so that if the polypeptide/compound complex is detected, a compound that binds to the polypeptide of claim 10 is identified.

19.   A method of producing the polypeptide of claim 10, comprising,

a)   culturing a host cell comprising a polynucleotide sequence selected from the group consisting of a polynucleotide sequence of SEQ ID NO: 1-739, a mature protein coding portion of SEQ ID NO: 1-739, an active domain of SEQ ID NO: 1-739, complementary sequences thereof and a polynucleotide sequence hybridizing under stringent conditions to SEQ ID NO: 1-739, under conditions sufficient to express the polypeptide in said cell; and

b)   isolating the polypeptide from the cell culture or cells of step (a).

20.   An isolated polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 740-1478, the mature protein portion thereof, or the active domain thereof.

21.   The polypeptide of claim 20 wherein the polypeptide is provided on a polypeptide array.

22.   A collection of polynucleotides, wherein the collection comprises the sequence information of at least one of SEQ ID NO: 1-739.

23.   The collection of claim 22, wherein the collection is provided on a nucleic acid array.

24.   The collection of claim 23, wherein the array detects full-matches to any one of the polynucleotides in the collection.

25.   The collection of claim 23, wherein the array detects mismatches to any one of the polynucleotides in the collection.

26.   The collection of claim 22, wherein the collection is provided in a computer-readable format.

27.   A method of treatment comprising administering to a mammalian subject in need thereof a therapeutic amount of a composition comprising a polypeptide of claim 10 or 20 and a pharmaceutically acceptable carrier.

28.   A method of treatment comprising administering to a mammalian subject in need thereof a therapeutic amount of a composition comprising an antibody that specifically binds to a polypeptide of claim 10 or 20 and a pharmaceutically acceptable carrier.

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aaactttgtg ctaatgtcca attaaaatat cctgagtttt attatttaaa acaaaaaaaa   1560
aa                                                                   1562
```

```
        <210> 4
        <211> 745
        <212> DNA
        <213> Homo sapiens

        <400> 4
agggcttggg gctgggtctc cgtgacagag gcctggcttt tctgtcaggg cagggcctag     60
cccctgcccc cataaaagag gagacatagg gggcttggtg agataccctg aaacctcccc    120
```

```
cctctgaccc cgcagccagg ccccaggctg gccgggagtg gcccctcaca ctggttctcc    180
ccactttctc tgcctgtggc atcgaaggcc ccgggcacca tggcccaggc cctgggggag    240
gacctggtgc agcctcccga gctgcaggat gactccagct ccttggggtc cgactcagag    300
ctcagcgggc ctggcccata tcgccaggcc gaccgctatg gattcattgg gggcagctca    360
gcagagccag ggccgggcca cccacctgca gacctcatcc gccaacggga gatgaagtgg    420
gtggagatga cctcgcactg ggagaaaacc atgtcccggc ggtacaagaa ggtaaagatg    480
cagtgccgga aaggcatccc gtctgccctg cgcgccgat gctggcccct gttgtgtggg    540
gcccatgtgt gccagaagaa cagccctggc acctatcagg agctggcaga ggcccctgga    600
gacccacagt ggatggagac cattggcagg gacctgcacc gtcaattccc tctgcacgag    660
atgtttgtgt cgcctcaagg ccacgggcag caggggctcc tgcaggtgct caaggcctac    720
accctgtatc gaccggagca aggct                                          745
```

```
        <210> 5
        <211> 536
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 5
acggaagctc ggttgatgtt tctgcagaag ttttccccct tggtcggtgg cggagctgct     60
gagcgcgata gtagcagctc cggcggcagc aacattgact acgaggaatg gcggcggctg    120
ccgcaggacc tgcagcatcc cagaggtttt tccagagctt ctcagatgct ctaatcgacc    180
aggacccca ggcggcgtta gaggtgggag agcctttct gcttcctcca ctcccggctg     240
acccgcctcc ttccagcacc gcctgattag gactcaggct ctagtgatgc tgcgtctcag    300
ccccagtatt gagattctcg gtctcctttc tctctctcac ggtagccgcg ttacctcaga    360
ctcctgtctt gccctttcca cttccagact cttgcattcc tgaagcttct gagaaaaact    420
tcctctattt attgggagca tggttggcat ctgcagttgg gctgaaagga tttttttttt    480
ttaatgacta aaaaagaaaa ggggactctg ggctcgatga aaattaattt tttctt        536
```

```
        <210> 6
        <211> 780
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 6
attttatcga ctattccgtc agacgccctc ttgcctttag tgaactgcgg ggacctggcc     60
tttgccggta ggggccagcg cagaaaagcc tgggagatgc gcgtccaggc cgcgagtgc    120
ggggaagctg cgggaccgca gagtccgctc ggcagccggt agtcagggcg ccggggcgtt    180
aggcttcaga tttacttcaa tgttcctaat gggcttgctt cagaagtgct cactgttctc    240
gccacctgag gaaccgcatt ttcatgtatt tgtattggga caagacgcgg agtccggtgt    300
gtaaagggcc tgctttgagg gaagaaaggc cgcagcccag gctcaaactg gaggattata    360
aggatcgcct gaaaagtgga gagcatctta atccagacca gttggaagct gtagagaaat    420
atgaagaagt gctacataat ttggaatttg ccaggagct tcaaaaaacc ttttctgggt     480
tgagcctaga tctactaaaa gcgcaaaaga aggcccagag aagggagcac atgctaaaac    540
ttgaggctga gaagaaaaag cttcgaacta tacttcaagt tcagtatgta ttgcagaact    600
tgacacagga gcacgtacaa aaagacttca aggggggttt gaatggtgca gtgtatttgc    660
cttcaaaaga acttgactac ctcattaagt tttcaaaact gacctgccct gaaagaaatg    720
aaagtctgag acaaacactt gaaggatcta ctgtctaaat tgctgaactc aggctatttt    780
```

```
<210> 7
<211> 654
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(654)
<223> n = a,t,c or g
```

```
<400> 7
ctccccgtct cttccctggc cttgccctct ctctttctgc cctgtagccg cgggcgtcca    60
aatgaagctg gaattcctcc agcgcaaatt ctgggcggca acgcggcagt gcagcactgt   120
ggatgggccg tgcacacaga gctgcgagga cagtgatctg gactgcttcg tcatcgacaa   180
caacgggttc attctgatct ccaagaggtc ccgagagacg ggaagatttc tgggggaggt   240
ggatggtgct gtcctgaccc agctgctcag catggggggtg ttcagccaag tgactatgta   300
tgactatcag gccatgtgca aaccctcgag tcaccaccac agtgcagccc agcccctggt   360
cagcccaatt tctgccttct tgacggcgac caggtggctg ctgcaggagc tggtgctgtt   420
cctgctggag tggagtgtct ggggctcctg gtacgacaga ggggccgagg ccaaaagttg   480
tcttccatca ctcccacaaa cacaagaagc aggacccgct gcagccctgc gacacggagt   540
accccgtgtt cgtgtaccag cccggccatc cgggaggcca acggggattc gtggagtgcg   600
ggcccttncc agaaagggta tttgttggtg cangcagatt ccnaacatta aact           654
```

```
<210> 8
<211> 469
<212> DNA
<213> Homo sapiens
```

```
<400> 8
tgccgtgggc ggctggccca gctggaggaa gcggcggtgg cggccacgat gagtgcgggc    60
gacgcagtgt gcaccggctg gctcgttaag tcgccccccg agaggaagct acagcgctac   120
gcctggcgca agcgctggtt tgtcctccgg cgaggccgca tgagcggcaa ccccgatgtc   180
ttggagtact acaggaacaa gcactccagc aagcccatcc gggtgataga cctcagcgag   240
tgtgcagtgt ggaagcatgt gggccccagc tttgttcgga aggaatttca gaataatttc   300
gtgttcattg tcaagactac ttcccgtaca ttctacctgg tggccaaaac tgagcaagaa   360
atgcaggtgt gggtgcacag catcagtcag gtctgcaacc ttggccacct ggaggatggt   420
gcagcagatt ccatggagag cctctcttac acgcgctcct acctgcagc                 469
```

```
<210> 9
<211> 409
<212> DNA
<213> Homo sapiens

<220>
```

```
<221> misc_feature
<222> (1)...(409)
<223> n = a,t,c or g
```

```
<400> 9
agaaaccnaa cagatctgtg gggcaggaaa atgtttcttt tccagctttc acagctctct   60
gagaaggggc atggtgggaa ttttagccga tttaataaaa gctgcagcat gagacctgtg   120
aatcccaccc tgctgcttcc tggatcctgc cacaccccat ccagcagcaa ccaagccagt   180
ctcgcccctg actgggacag agtggctgag aggggctctg gagccagctg cctggatttg   240
aatcccagct gtgccactta ccagctgtgt gactgtagga agctactctt tgtccgtgcg   300
agactacgac cctcggcagg gagataccgt gaaacattac aagatccgga cccttgaaca   360
aacggggctt ctacatatcc cccccgaagc accttcagca ctctgcagg              409
```

```
<210> 10
<211> 1145
<212> DNA
<213> Homo sapiens
```

```
<400> 10
aaagattctg ttttgaatat agccagagga aaaaagtatg gagaaaaaac taagagagtg   60
tcttctcgga aaaaaccagc cttgaagtgt cttctcagaa acaaccagca ttgaaggcta   120
tctgtgacaa ggaagattct gttccgaata cggccacgga aaaaaaggat gaacaaatat   180
ctgggacagt gtcttctcag aaacaaccag ccttgaaggc tacaagtgac aagaaagatt   240
ctgtttcgaa tatacccaca gaaataaagg atggacaaca atctggaaca gtgtcttctc   300
agaaacaacc ggcctggaag gctacaagtg tcaagaaaga ttctgtttcg aatatagcca   360
cagaaataaa ggatggacaa ataccgtggg acagtgtctt ctcagagaca accagccttg   420
aaggcttaca ggtgatgaga aagattctgt ttcgaatata gccagagaaa taaggatgg    480
agaaaaatct gggacagtgt ctcctcagaa acaatcggcc cagaaggtta tatttaaaaa   540
gaaagtttct cttttgaata ttgccacaag aataacgggc ggttggaaat ctggaacaga   600
gtatcctgag aatctgccca ccttgaaggc tacaattgaa aataaaaatt ctgttctgaa   660
tacagccacc aaaatgaaag atgtacaaac atccacacca gaacaagact tagaaatggc   720
atcagaggga gagcaaaaga ggcttgaaga atatgaaaat aaccagccac aggtgaaaaa   780
ccaaatacat tctaggggatg accttgatga cataattcag tcatctcaaa cagtctcaga   840
ggacggtgac tcgctttgct gtaattgtaa gaatgtcata ttactcattg atcaacatga   900
aatgaagtgt aaagattgtg ttcacctatt gaaaattaaa aagacatttt gtttatgtaa   960
aagattaaca gaacttaaag ataatcactg tgagcaactt agagtaaaaa ttcgaaaact   1020
gaaaaataag gctagtgtac tacaaaagag actatctgaa aaagaagaaa taaaatcgca   1080
gttaaagcat gaaacacttg aattggaaaa agaactctgt agtttgagat ttgccataca   1140
gcaag                                                              1145
```

```
<210> 11
<211> 890
<212> DNA
<213> Homo sapiens
```

<400> 11
```
gtagtccgct gcggtaccgg gccggacaat ctgggtcgac gatttcgagc tcgtcatgcg      60
caatgtggcg ctgcggcggg cggcagggcc tgtgtgtgct gaggcggctg agcggcggac     120
atgcacacca cagagcgtgg cgatggaaca gtaaccgggc ttgtgagagg gctctgcagt     180
ataaactagg agacaagatc catggattca ccgtaaacca ggtgacatct gttcccgagc     240
tgttcctgac tgcagtgaag ctcacccatg atgacacagg agccaggtat ttacacctgg     300
ccagagaaga cacgaataat ctgttcagcg tgcagttccg taccactccc atggacagta     360
ctggtgttcc tcacattctt gagcataccg tcctttgtgg gtctcagaaa tatccgtgca     420
gagacccttt cttcaaaatg ttgaaccggt ccctctccac gttcatgaac gccttcacag     480
ctagtgatta tactctgtat ccattttcca cacaaaatcc caaggacttt cagaatctcc     540
tctcggtgta tttggatgcc accttttttcc catgtttacg cgagctggat ttctggcagg     600
aaggatggcg gctggaacat gagaatccga gcgacccccca gacgcccttg gtctttaaag     660
gagtcgtctt taatgagatg aagggagcgt ttacagacaa tgagaggata ttctcccagc     720
accttcagaa cagacttctt cctgaccaca cgtactcagt ggtctccggg ggtgacccac     780
tgtgcatccc ggagcttaca tgggagcagc ttaagcagtt tcatgccact cactatcacc     840
caagcaatgc taggttcttc acgtacggta attttccctt agaccagcat                 890
```

<210> 12
<211> 982
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(982)
<223> n = a,t,c or g

<400> 12
```
tttcgtcaca cacgcacacg caccctgcca ctgcagccgc catggatatc agctaacaac      60
acacacccag gcgcgcgcgc gcgttcccac tcgcaccacg caggagtggc ccccggcatc     120
cctaccctcc ttccccaccc ccaccacacc cgctcaccag ctcggctact gctcgctccg     180
gctgccgccg ccgccgccgc cgacgccacc accactgctt cctctgctgc ggggccacag     240
ccttgagtgt cattcaaggg acagcacaac ctcatccaag ctctcctacc tctgcccagc     300
cgtgcctctc atcctcccca ttcctcgtcc acactccatc caaagaagag ggaaagcacc     360
gaatagaggg gggcgaaggc aaagtctgct gttcttcccc ctgggccccc ttgctcctcc     420
atcctcattc tctcaccacc agccccccta accccaagga gcccaggaac tgaggcgact     480
cgccccactg ccatgtccaa aagcttgaaa aagaaaagcc actggactag caaagtccat     540
gagagtgtca ttggcaggaa cccggagggc cagctgggct ttgaactgaa ggggggcgcc     600
gagaatggac agttcccta cctggggggag gtgaagcccg gcaaggtggc ctatgagagc     660
ggcagcaaat tggtgtcgga ggagctgctg ctggaggtga cgagacccc cgtggcgggg     720
ctcaccatca gggacgtgct ggccgtgatc aaacactgca aggacccct ccggctcaag     780
tgtgtcaagc aaggtgagag cagcggcttg ctcagtgttt tgccgggcgg tgggaccgct     840
cggggcgcag ggcaatgaaa gggtggccgc gcatgttgaa gggggtgtgt tgcgcgatga     900
tggggtgggg gccagagagc acccgcagtg caagtgagtt tcgccgggga ttcgacgaaa     960
tcgtnncccg ggaattccgg ac                                              982
```

<210> 13
<211> 440
<212> DNA
<213> Homo sapiens

6

```
<400> 13
ccgtgccgga attcccgcgt cgacgatttc gtggctaagg cgccaggcac gggcaccacc    60
agggcgccca ggagccgccc gccgccggca tggaccagct gtactgccca ccgagcgcgt   120
gccagtcttt tggtaagaac tagtcacaca gacctcaacc tgatgcgtgg agacaaggaa   180
atgcttttca gtgtgtccag aaagagaaaa tgcaggtgtc ttctgcggag gtgcgcatcg   240
ggcccatgag actgacgcag gaccctattc aggttttgct gatctttgca aaggaagata   300
gtcagagcga tggcttctgg tgggcctgcg acagagctgg ttatagatgc aatattgctc   360
ggactccaga gtcagccctt gaatgctttc ttgataagca tcatgaaatt attgtaattg   420
atcatagaca aactcagaac                                                440
```

```
<210> 14
<211> 581
<212> DNA
<213> Homo sapiens
```

```
<400> 14
tttcgtttgg ccggctgcgg gcacctcctg gtctcgctgc tggggctgct gctgctgctg    60
gcgcgctccg gcacccgggc gctggtctgc ctgccctgtg acgagtccaa gtgcgaggag   120
cccaggaact gcccggggag catcgtgcag ggcgtctgcg gctgctgcta cacgtgcgcc   180
agccagagga acgagagctg cggcggcacc ttcgggattt acggaacctg cgaccggggg   240
ctgcgttgtg tcatccgccc cccgctcaat ggcgactccc tcaccgagta cgaagcgggc   300
gtttgcgaag atgagaactg gactgatgac caactgcttg gttttaaacc atgcaatgaa   360
aaccttattg ctggctgcaa tataatcaat gggaaatgtg aatgtaacac cattcgaacc   420
tgcagcaatc cctttgagtt tccaagtcag gatatgtgcc tttcagcttt aaagagaatt   480
gaagaagaga agccagattg ctccaaggcc cgctgtgaag tccagttctc tccacgttgt   540
cctgaagatt ctgttctgat cgagggttat gctcctcctg g                       581
```

```
<210> 15
<211> 693
<212> DNA
<213> Homo sapiens
```

```
<400> 15
tttcgtatgg cggccaatgt gggatcgatg tttcaatatt ggaagcgctt tgatttacag    60
cagctgcaga gagaactcga tgccaccgca acggtattgg cgaaccggca ggatgaaagt   120
gagcagtcca gaaagcggct tatcgaacag agccgggagt tcaagaagaa cactccagag   180
gtgaggcgcg tgaccatcgt gttcgctttg aagggatctt agaatgctgg tgcatgttca   240
ggcgacgctc cgtgagcgtt tcattttcat cagatgaacg cacggccggc aaacaacccg   300
tttctttccc cagatgtctt cagccccatt tccagcagaa cgcatgccat cctgcaggct   360
gtggggatgt ggaaattgat aggttgtctg gaaatatgaa agtcagagcc aattccaggt   420
gcagatactg gacaagcttg gtctgtaaga aacgtgggc aggtgtgtgg gtgtctcaaa   480
ccctcgagct catcccagac cctgtcccat gtcagttagc aagccaccaa agtccataag   540
ggatcctgtg gggtggaagg tccgcggggc ctgcttccct gttgctggtg caggcggagt   600
gtctgaaggc tgcacgcatc tgggcatagc agtgcgccta acgcttcttg taaaacagac   660
```

7

atttcgcctg ctaagccttt taaatgcctc tct   693

        <210> 16
        <211> 562
        <212> DNA
        <213> Homo sapiens

        <400> 16
tttcgtggaa agagagaaac caccgctgcg ggtgggtaga gaagcacttg gcgcctcggg   60
gaggggaccg cgcccgcctc atttgcgcct tgcagcactg ctggaccagg ttacaagatg   120
ttcacctaag attgagacct agtgactaca tttcctacgg gaacaaataa atggtttttc   180
atctcccgga gatacattac aaacaaatat ggtgctaaaa gaactcctta cctttctctg   240
actacaattt atttggacat acttttgtat tgaagagagg tatacatact gaagctactt   300
gctgtactat aggagactct gtcctgtagg atcatggacc atcctagtag ggaaaaggat   360
gaaagacaac ggacaactaa acccatggca caaggagtg cacactgctc tcgaccatct   420
ggctcctcat cgtcctctgg ggttcttatg gtgggaccca acttcagggt tggcaagaag   480
ataggatgtg ggaacttcgg agagctcaga ttaggtgaag gtctcccaca ggtgtattac   540
tttggaccat gtgggaaata ta   562

        <210> 17
        <211> 899
        <212> DNA
        <213> Homo sapiens

        <400> 17
tttcgtgcgt ccccggccca accatggcgt cctccgcggc cggctgcgtg gtgatcgttg   60
gcaggaagtc tgaaacagca gttggagtgt agtggttaag aggaaggact caggagtcag   120
attgcttggc ttcatctcat agatccataa cttatcaccc ttgtggactt aattcctcca   180
tgcctcagtt tatcacttat gtaggcttaa ttcctccatg cctcagtttc cctacatata   240
aaatggaaat actaataaca cttatcttgt agggttgttg taaagattaa catagtggag   300
tcattgggcg aagctgggcc atgctgtttg ccagtggagg cttccaggtg aaactctatg   360
acattgagca acagcagata aggaatgccc tggaaaacat caggtgggcc agccggcgct   420
ctccagaagg aatggaagtg ggtctgtttc tctcagttgg tcttgtttgt catatcctca   480
aggctatgag gatctgtgat gtcacatttt cgtctgatgg ctactgcagt gcctctagt   540
tggtaaaggc caggcctaca gtggctggaa tgtgaattca cactggggaa gggctcccat   600
gggggaggaa acgacccttc ttgctaagag gatctgcatc aagcgtgagt gactttgcag   660
gcttctccag ctgtttgccc cggggctgga gggctggggt ttcctgcttc catctaggca   720
ggaggaactc gcttccagca tgtgacagcc atagctgcag gggcattaca gtttaagaac   780
agaggtcctg cagcttgttt tgacctgttg atctagtaat ggtaggaccc aaatgaaaac   840
atcttgaatt ttagttagag gtttagcact catgtgagag gacagaactg gagctgttt   899

        <210> 18
        <211> 519
        <212> DNA

<213> Homo sapiens

<400> 18

```
ggaattcccg ggtcgacgat ttcgtctccg cccgcccgaa gccgcgccca ctgcccagag      60
ccagagggat ggtggtagtc acggggcggg agccagacag ccgtcgtcag gacggtgcca     120
tgtccagctc tgacgccgaa gacgactttc tggagccggc cacgccgacg gccacgcagg     180
cggggcacgc gctgccctg ctgccacagg agtttcctga ggttgttccc cttaacatcg      240
gaggggctca cttcactaca cgcctgtcca cactgcggtg ctacgaagac accatgttgg     300
cagccatgtt cagtgggcgg cactacatcc ccacggactc cgagggccgg tacttcatcg     360
accgagatgg cacacacttt ggagatgtgc tgaatttcct gcgctcaggg gacctcccac     420
ccagggagcg tgttcgagct gtgtacaaag aggcccagta ctatgccatc gggcccctcc     480
tggagcagct ggagaacatg ccgccactga aaggcgaga                           519
```

<210> 19
<211> 460
<212> DNA
<213> Homo sapiens

<400> 19

```
tttcgtgcag gggccaggcc tctctaggct ctccggctga gccgggttgg ggcccgggtt      60
gggccgcccg gggactctgg agcattggga tttgtagcgc gccctctggg taggcggctg     120
tagcggagag gcgtgcggga tcgggatgtc ggggctgctc acggacccgg agcagagagc     180
gcaggagccg cggtaccccg gcttcgtgct ggggctggat gtgggcagtt ctgtgatccg     240
ctgccacgtc tatgaccggg cggcgcgggt ctgcggctcc agcgtgcaga aggtagaaaa     300
tctttatcct caaattggct gggtagaaat tgatcctgat gttctttgga ttcaatttgt     360
tgccgtaata aaagaagcag tcaaagctgc aggaatacag atgaatcaaa ttgttggtct     420
tggcatttca acacagagag caacttttat tacgtggaac                          460
```

<210> 20
<211> 731
<212> DNA
<213> Homo sapiens

<400> 20

```
gagatcaagg agggctcaga agaggcgatg tctgatctgt cctccaggca gcaaaggaaa      60
gggaggtgtg ttcctggcag aaggcacagc ttgtactgag gcctggcagc agaacagagt     120
atgcaatttg tgaagctgtg gtgtggctgc agtggagagt tcccaacaag gctacgcaga     180
agaacccct tgactgaagc aatggagggg ggtccagctg tctgctgcca ggatcctcgg      240
gcagagctgg tagaacgggt ggcagccatc gatgtgactc acttggagga ggcagatggt     300
ggcccagagc ctactagaaa cggtgtggac ccccaccac gggccagagc tgcctctgtg       360
atccctggca gtacttcaag actgctccca gcccggccta gcctctcagc caggaagctt     420
tccctacagg agcggccagc aggaagctat ctggaggcgc aggctgggcc ttatgccacg     480
gggcctgcca gccacatctc ccccggggcc tggcggaggc ccaccatcga gtcccaccac     540
gtggccatct cagatgcaga ggactgcgtg cagctgaacc agtacaagct gcagagtgag     600
```

9

```
attggcaagg gtgcctacgg tgtggtgagg ctggcctaca acgaaagtga agacagacac      660
tatgcaatga aagtcctttc caaaaagaag ttactgaagc agtatggctt tccacgtcgc      720
cctcccccga a                                                           731
```

```
        <210> 21
        <211> 519
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 21
tttcgtttat gggaagccag taacactgtg gcctactatc tcttccgtgg tgccatctac       60
atttttggga ctcgggaatt atgaggtaga ggtggaggcg gagccggatg tcagaggtcc      120
tgaaatagtc accatggggg aaaatgatcc gcctgctgtt gaagcccct tctcattccg        180
atcgcttttt ggccttgatg atttgaaaat aagtcctgtt gcaccagatg cagatgctgt       240
tgctgcacag atcctgtcac tgctgccatt gaagtttttt ccaatcatcg tcattgggat       300
cattgcattg atattagcac tggccattgg tctgggcatc cacttcgact gctcagggaa       360
gtacagatgt cgctcatcct ttaagtgtat cgagctgata gctcgatgtg acggagtctc       420
ggattgcaaa gacggggagg acgagtaccg ctgtgtccgg gtgggtggtc agaatgccgc       480
gctccaggtg ttcacagctg cttcgcggaa gaccatgtg                             519
```

```
        <210> 22
        <211> 544
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 22
tttcgtgctg gaggttcgct agccgaagcg gctgcatctg gcgccgcgtc tgccccgcgt       60
gctcggagcg gattctgccc gccgtccccg gagccctcgg cgccccgctg agcccgcgat      120
cacttcctcc ctgtgaccaa ccggcgctgc aggttagagc ctggcaatgc cgtttgggtg      180
tgtgactctg ggcgacaaga agaactataa ccagccatcg gaggtgactg acagatatga      240
tttgggacag gtcatcaaga ctgaggagtt ttgtgaaatc ttccgggcca aggacaagac      300
gacaggcaag ctgcacacct gcaagaagtt ccagaagcgg gacggccgca aggtgcggaa      360
agctgccaag aacgagatag gcatcctcaa gatggtgaag catcccaaca tcctacagct      420
ggtggatgtg tttgtgaccc gcaaggagta ctttatcttc ctggagctgt gagtgtgggt      480
ctggggaccc aaaattcccc agcgcccagg gctttcacct gtcccaccct ctgcagctaa      540
ggag                                                                   544
```

```
        <210> 23
        <211> 749
        <212> DNA
        <213> Homo sapiens
```

10

```
<400> 23
caacgtcgac gatttcgtgc ggggctgtgg ggagggcacg gactgacaga cggactccgg    60
cggaatgggg ggtgtggctg ctccgccagg gtccccaggg tgggagagcg gctccgcggc   120
caccgatgcc cggaccccct ctgtcttctg ctagacatgc tcttcctctc gtttcatgca   180
ggctcttggg aaagctggtg ctgctgctgc ctgattcccg ccgacagacc ttgggaccgg   240
ggccaacact ggcagctgga gatggcggac acgagatccg tgcacgagac taggtttgag   300
gcggccgtga aggtgatcca gagtttgccg aagaatggtt cattccagcc aacaaatgaa   360
atgatgctta aattttatag cttctataag caggcaactg aaggaccctg taaactttca   420
aggcctggat tttgggatcc tattggaaga tataaatggg atgcttggag ttcactgggt   480
gatatgacca aagaggaagc catgattgca tatgttgaag aaatgaaaaa gattattgaa   540
actatgccaa tgactgagaa agttgaagaa ttgctgcgtg tcataggtcc attttatgaa   600
attgtcgagg acaaaaagag tggcaggagt tctgatataa cctcagatct tggtaatgtt   660
ctcacttcta ctccaaacgc caaaaccgtt aatggtaaag ctgaaagcag tgacagtgga   720
gccgagtctg aggaagaaga ggcgtgtgt                                     749
```

```
<210> 24
<211> 556
<212> DNA
<213> Homo sapiens
```

```
<400> 24
tttcgtgctt taaggggcgg acgggcggga ggtcggggtc ctccggggat tcgagccggt    60
gggctcgttg tgggcgccat ttctcggcgt ctaccgagga gccgcccctt tctcagcctt   120
gctcggctct tccccgctct ggtcgccggg gctgcgccgt ccccagctca gtgacaaaaa   180
tgctgagttt cttccgtaga acactagggc gtcggtctat gcgtaaacat gcagagaagg   240
aacgactccg agaagcacaa cgcgccgcca cacatattcc tgcagctgga gattctaagt   300
ccatcatcac gtgtcgggtg tcccttctgg atggtactga tgttagtgtg gacttgccaa   360
aaaaagccaa aggacaagag ttgtttgatc agattatgta ccacctggac ctgattgaaa   420
gcgactattt tggtctgaga tttatggatt cagcacaagt agcacattgg ttggatggta   480
caaaaagcat caaaaagcaa gtaaaaattg gttcacccta ttgtctgcat cttcgagtta   540
agttttattc ctcaga                                                   556
```

```
<210> 25
<211> 422
<212> DNA
<213> Homo sapiens
```

```
<400> 25
gtcggtgaga atccagggag aggagcggaa acagaagagg ggcagaagac cggggcactt    60
gtgggttgca gagcccctca gccatgttgg gagccaagcc acactggcta ccaggtcccc   120
tacacagtcc cgggctgccc ttggttctgg tgcttctggc cctgggggcc gggtgggccc   180
aggaggggtc agagcccgtc ctgctggagg gggagtgcct ggtggtctgt gagcctggcc   240
gagctgctgc aggggggccc gggggagcag ccctgggaga ggcacccct gggcgagtgg   300
catttgctgc ggtccgaagc caccaccatg agccagcagg gaaaccggc aatggcacca   360
gtggggccat ctacttcgac caggtcctgg tgaacgaggg cggtggcttt gaccgggcct   420
ct                                                                  422
```

<210> 26
<211> 506
<212> DNA
<213> Homo sapiens

<400> 26
```
agaagatgtg aagtcgtatt atacagtaca tctaccacaa ttagaaaata tcaatagtgg    60
tgaaaccaga acaatatctc actttcatta tactacttgg ccagattttg gagtccctca   120
atcaccagct tcatttctca atttcttgtt taaagtgaga gaatctggct ccttgaaccc   180
tgaccatgga cctgtggtga tccaccgtag tgcaggcact ggacgctcca gcaccttctc   240
tgtggtacac acttgtcttg ttttgatgga aaaaggagat gatattaaca ttaaacaagt   300
gttactgaac ataagaaaat tccaaatggg tcttatctca gaccccagat caactgagat   360
tctcatacat ggctataaca gaaggagcaa aatgtgtaaa gggagattct agtatacaga   420
aacgatggaa agaactttct aaggaagact ccctcctgct tttgatcatt caccaaacaa   480
aataatgact gaaaaataca atagga                                        506
```


<210> 27
<211> 850
<212> DNA
<213> Homo sapiens

<400> 27
```
caggcctttg tgtaaggcca gaggaggatc acgggtgcca taaaccttca cggggccaag    60
ggctggtgtc ccggggctgg tgacttaaca ggcagagatg tggagaccag gtgcttgtgc   120
ccgggacggg cctggctgcc atcctgagga cactgcccat gttccatgac gaggagcacg   180
cccgagcccg cggcctctct gaggacaccc tggtgctacc cccggccagc cgcaaccaga   240
ggattctcta caccgtgctg gagtgccagc ccctcttcga ctccagtgac atgaccatcg   300
ctgagtgggt ttgccttgcc cagaccatca gaggcacta cgagcagtac cacggctttg   360
tggtcatcca cggcaccgac accatggcct ttgctgcctc gatgctgtcc ttcatgctgg   420
agaacctgca gaagactgtc atcctcactg gggcccaggt gcccatccat gccctgtgga   480
gcgacggccg tgagaacctg ctgggggcac tgctcatggc tggccagtat gtgatcccag   540
aggtctgcct tttcttccag aatcagctgt ttcggggcaa ccgggcaacc aaggtagacg   600
ctcggaggtt cgcagctttc tgctccccga acctgctgcc tctggccaca gtgggtgctg   660
acatcacaat caacagggag ctggtgcgga aggtggacgg gaaggctggg ctggtggtgc   720
acagcagcat ggagcaggac gtgggcctgc tgcgcctcta ccctgggatc cctgccgccc   780
tggttcgggc cttcttgcag cctcccctga agggcgtggt catggagacc ttcggttcag   840
ggaacggacc                                                          850
```


<210> 28
<211> 990
<212> DNA
<213> Homo sapiens

```
<400> 28
tttttttttt ttacttgtaa tacgtatttt aattttgttt tcatatgagt ttaagtgttg      60
tctaggtgac atcaaaatct aaggcaaaca gacttgacca tcttcagacc cactgcattc     120
tcaagctgaa gtggtctgct catagtttgt gtgccaggtt gctcatcagt attgatactg     180
tcccagaaca ggttgtaggt ataattcaga gactgtcctt tgcaaaggaa atgaccagca     240
tttcaactgt atgtcttcct ggaagggtag attctgctat atcttctttg tctgcatcaa     300
aagactcaag aggaatgtgg acacatttca tatcccattt gtagagtaaa gcttcaagtg     360
accagtcagc actcctaact tgataagtag accacaattg gaccttggga ttcttgtgca     420
tcaaaaaata tattgtagcc aaaatgtctt caaatcttc tggttcaaag aacacatcag      480
atgcaaggat aatatcttgt ggtggtagag ccagaagatc ccaagatata tgaccccatg     540
ttagtcctac cacctgcaga tgtggcaggt tattcatttg gcagctttgc cgacagactt     600
ccagacagtg aggcagttct gagctgtctg acagtattac ttctgcacca catttggcag     660
ccaaaattcc tggaaggctc actccagctc caatctgcgg gacgtggacc tccaggacag     720
ccccgtcggc ccccggaccc ggctcctccg agaatcgaaa gcgctgggcc cggacccccct    780
gtcctcggaa atcgtgctcg cccagtaggg cgtcgttggg ccccgggcgg gcggggggacc    840
gcggaaggct ccgggctgcc agactgcgcg agcgggaagc cgcgggccac gtggccgtag     900
cacctgacgg caagaagggg aaagcccaga tctggtgata accctgccgc gctagcgagc     960
gaagaaagcc cggagcaagg cgaaagagac                                      990
```


```
<210> 29
<211> 622
<212> DNA
<213> Homo sapiens
```


```
<400> 29
tttttttttt ttgtgttgat aaagctttat ttataaacac actcacaggg ccagatttgg      60
gccacgggcc atagttgcca gcccggcttt aactgctggt cctcacgtta gtctcactgc     120
ctcctgcagg gtgggcatgt gggtgtcgtg ttcacccagc cccttcctcc accccacaaa     180
caccctggtg gctgtcctgg agcgcgacac actgggcatc cgtgaggtgc ggctgttcaa     240
tgccgttgtc cgctggtccg aggccgagtg tcagcggcag cagctgcagg tgacgccaga     300
gaacaggcgg aaggttctgg gcaaggccct gggcctcatt cgcttcccgc tcatgaccat     360
cgaggagttc gctgcaggta acagagctcg ggctcagggg ctggtttggg aggggagtgg     420
cacacaggtg ggcatctggg taccgaggat agtgcccccg agttcactgc ggaaagcctg     480
gcagatgcct ggcatataca gataggaaga aacctggctt gtgaggacgc gtccacaggg     540
ccatctgtta gccccggccc ggctctgtcc ccaccgtgca cactgccaga ccccgcctct     600
cgtgtctgtc cagctgtttt gg                                              622
```


```
<210> 30
<211> 181
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(181)
<223> n = a,t,c or g
```

```
        <400> 30
ttttttttttt ttgagacgga gntgngctct gtnacccagg ntagagtgca atggcacgnt      60
ctcggctcac tgcaagctct gcgtcctggg ttgacgccat tctcctgcct cagcctcccg     120
agtagctggg actacaggag cttcgccacc aattccagcc tggggtggac agagtgataa     180
g                                                                     181
```

```
        <210> 31
        <211> 1956
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 31
aaactccgaa cacatccaaa catcagaagg aacaaactcc agacacaccg cctttaagaa      60
ctgttacgct caccgcgagg gtccacggct tcattctcca agtcagacca agaacccacc     120
aattccggac acaaaaggcg tagcgtgcct cctgtgattg ttgaagagct gtggtgtgct     180
gctgagtggc gtgtgtattc catgtgaggg gaagggtcca acagtcctgg tcattcagac     240
tgcagttccc caggacagac ccacgaagtc aagcatgcgg agtgcagcca gccctggaa     300
cccagccatc agagcagggg gccacggccc agaccgggtg cggcctctgc ctgcagcctc     360
ttccggcatg aagagttcta agtcttcaac ttccttggct tttgagtccc gactcagcag     420
gctcaagagg gccagcagtg aggacacgct caacaagcca ggaagtaccg ctgcatcggg     480
ggtggttcgc ctgaagaaga ccgccactgc cggagccatc tcggagctca cggagagccg     540
cctgaggagc ggcacagggg cctttacaac aactaaacgg acaggcattc cagccccacg     600
ggaatttTca gtaactgtct caagagagag gtctgtgcca cgtggtccct ccaaccccag     660
gaaatcagtg tccagtccaa cttcctccaa cactcccact cctacgaaac acctgaggac     720
cccttccaca aagcccaagc aagagaatga aggtggagaa aaggctgcgc ttgagtccca     780
agttcgggaa cttttggcag aagccaaagc aaaagatagt gaaattaaca ggcttcgaag     840
tgaactaaag aaatacaaag agaaaaggac tctgaacgct gaggggactg atgctttggg     900
cccaaatgtc gatggaacat cagtctcccc aggtgacacg gaacctatga taagagctct     960
tgaggagaag aacaagaact ttcagaaaga gctttccgat ctagaggaag aaaaccgggt    1020
cctgaaggag aaactgatct atcttgagca ctccccaaat tcagaagggg cagcaagtca    1080
cactggcgac agcagctgcc caacatccat aactcaagag tcaagcttcg gaagcccaac    1140
tggaaatcag ttgtccagtg acattgatga gtataaaaaa aacatacatg gaaatgcatt    1200
acggacatca ggctcctcaa gtagcgatgt taccaaagct tctttgtcgc cagatgcttc    1260
cgactttgag cacattacag cagagacacc ctcaaggccc ctgtcctcca ccagtaaccc    1320
ctttaagagt tcaaagtgtt ctactgctgg gagttcccca aacagcgtaa gtgaattgtc    1380
cctggcttcc ctcacagaga agatacaaaa gatggaagaa aaccaccata gcactgcaga    1440
agaactacag gctactctac aagaattatc agaccagcaa caaatggtac aggaattgac    1500
agctgaaaat gagaagctgg tggatgaaaa gacgatttta gagacatcct ttcatcagca    1560
tcgagagagg gcagagcagc taagtcaaga aaatgagaag ctgatgaatc ttttacaaga    1620
gcgagtaaag aatgaagagc ccaccactca ggaaggaaaa attattgaac tggagcagaa    1680
gtgcacaggt attcttgaac agggccgctt tgaaagagag aagctactca acattcagca    1740
gcagttgacc tgtagcttgc ggaaggttga ggaagaaaac caaggagctt tagaaatgat    1800
taaacgtctg aaggaagaaa atgaaaaact gaatgagttt ctagaactgg aacggcataa    1860
taataacatg atggccaaaa ctttggaaga gtgtagagtt accttggaag ggctaaaaat    1920
ggagaatgga tctttgaagt ctcatttgca gggtga                              1956
```

```
        <210> 32
        <211> 513
        <212> DNA
```

<213> Homo sapiens

```
<400> 32
ctcagcacca caaggaagtg cgggacccac acgcgctcgg aaagttcagc atgcatgaag   60
tttggggaga gctcggcgat taacacagcg acccgggcca gcgcagggcg agcgcaggcg   120
gcgagagcgc agggcggcgc ggcgtcggtc ccgggagcag aacccggctt tttcttggag   180
cgacgctgtc tctagtcgct gatcccaaat gcaccggctc atctttgtct acactctaat   240
ctgcgcaaac ttttgcagct gtcgggacac ttctgcaacc ccgcagagcg catccatcaa   300
agctttgcgc aacgccaacc tcaggcgaga tgagagcaat cacctcacag acttgtaccg   360
aagagatgag accatccagg tgaaaggaaa cggctacgtg cagagtccta gattcccgaa   420
cagctacccc aggaacctgc tcctgacatg gcggcttcac tctcaggaga atacacggat   480
acagctagtg tttgacaatc agtttggatt aac                                513
```

```
<210> 33
<211> 712
<212> DNA
<213> Homo sapiens
```

```
<400> 33
acagacatgg ttccagctct gtagaactga gagaaagaat aaacaagtca cacattagcc   60
cttcaaaaag atgaccgacc tcttgagaag tgttgtcacc gtaattgatg ttttctacaa   120
atacaccaag caagatgggg agtgtggcac actgagcaag ggtgaactaa aggaacttct   180
ggagaaagag cttcatccag ttctgaagaa cccagatgat ccagacacag tggatgtcat   240
catgcatatg ctggatcgag atcatgacag aagattggac tttactgagt ttctttttgat   300
gatattcaag ctgactatgg cctgcaacaa ggtcctcagc aaagaatact gcaaagcttc   360
agggtcaaag aagcataggc gtggtcaccg acaccaagaa gaagaaagtg aaacagaaga   420
ggatgaagag gatacaccag gacataaatc aggttacaga cattcaagtt ggagtgaggg   480
agaggagcat ggatatagtt ctgggcactc aaggggaact gtgaaatgta gacatgggtc   540
caactccagg aggctaggaa gacaaggtaa tttatccagc tctgggaacc aagagggatc   600
tcagaaaaga taccacaggt ccagctgtgg tcattcatgg agtggtggca aagacagaca   660
tggttccagc tctgtagaac tgagagaaag aataaacaag tcacacatta aa            712
```

```
<210> 34
<211> 600
<212> DNA
<213> Homo sapiens
```

```
<400> 34
cagatttctc aggtgagctc agatagcaat ccactgtgtt cctttatctc cagcagatat   60
atatcaatat cttgaagcag ttttctactc aatttagaag aacttctggt taaatttaca   120
attctttttt ctctcccatg cttgttgttt ctcattcaaa caagactggc atagctactt   180
tatgagggta ggtctccctg aattttaagt tccaaagatc tctggacctg atcatattga   240
ctttattccg tgggatcaac tcttcatggc cagttcttcc tctgtcactg agttcttagt   300
gctgggcttc tctagccttg gggaattgca gcttgtcctc tttgcagtct ttctctgcct   360
```

```
ctatttgatt atcttgagtg gaaacatcat catcatctca gtcattcatt tggatcacag   420
cctccacaca cccatgtact tctttctagg tattctttct atctctgaaa tcttctacac   480
aactgttatt ctgcccaaga tgcttatcaa cttattctct gtattcagga cactctcctt   540
tgtgagttgt gccacccaaa tgttctacga aatcgtcggc ccgggaactc aggaacggtc   600
```

```
        <210> 35
        <211> 985
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 35
tttcgtccta ctgtccctgt cctgcccttg cagacatgtg tcctgccctt gcagacagcc   60
gcaggcaggc agggaccacc atgagcaacc ccgtctctcc tcctgagggg cagcacagag   120
cctggaggag gcctgagtgg ggttgaggcc tggggcgagc tggggtggag gggcactggc   180
tgccgggctc cagggatctt ctccccttcc tgcccggag ggtgctggca caggggtggg   240
gctcactccc actccgtaga cacaatgatc agaggtcctg ggtgtctggg gaagctgggc   300
tgtgcgtgta tgcgtctacc atgtgggggt gcctgtgagt gtgctggggc gtctgcagtg   360
aaggcctcct gagaccactc cacggaaaca ccgggaatcc ctgcagctga gcctgtctct   420
cacgggaccg ggaagctgga gagagcccca accctgcccg ctggggccga gctccctgct   480
cctgcagcag tcccgtgccc cacactctga gtctgcccta tccacagctg ctgggcctct   540
ctgtggccac catggtgact cttacctact tcggggccca ctttgctgtc atccgccgag   600
cgtccctgga gaagaacccg taccaggctg tgcaccaatg ggggactcag cagcgactta   660
tccaacatcc agagagcggg agcgagggcc agagcctgct ggggccactc agggccttct   720
ctgcggggtt gagcctggtg ggcctcctga ctctgggagc cgtgctgagc gctgcagcca   780
ccgtgaggga ggcccagggc ctcatggcag ggggcttcct gtgcttctcc ctggcgttct   840
gcgcacaggt gcaggtggtg ttctggagac tccacagccc cacccaggtg gaggacgcca   900
tgctggacac ctacgacctg gtatatgagc aggcgatgaa aggtacgtcc cacgtccggc   960
ggcaggagct ggcggccatc cagga                                        985
```

```
        <210> 36
        <211> 464
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 36
ccgtatcggc gtttatatac tgaagataag cctgatgagt aacaggcttg ctcgtcatac   60
tttcgtgagt attggcgttg tacaggcaag tcgtaaaata acagcctggc tattcagagt   120
atgataaaaa cagggggcaa gggatgttgc ttaatatgat gtgtggtcgt cagctgtcgg   180
caatcagttt gtgcctggcc gtaacattcg ctccactgtt caatgcgcag gccgatgagc   240
ctgaagtaat ccctggcgac agcccggtgg ctgtcagtga acagggcgag gcactgccgc   300
aggcgcaagc cacggcaata atggcggga tccagccatt gcctgaaggt gcggcagaaa   360
aagcccgcac gcaaatcgaa tctcaattac ccgcaggtta caagccggtt tatcttaacc   420
agcttcaact gttgtatgcc gcacgcggta tttcctgcag cgtg                   464
```

16

```
<210> 37
<211> 429
<212> DNA
<213> Homo sapiens




<400> 37
tcgcacaaga gctgctgatg tctatgtctt ttcgctcacg ggaaaatctc gaaacgtgag      60
ttcctcaacc gtgcggcgaa gtgcggtagg cgggatgtcg gcattagcgt tgtttgattt     120
gctcaagcca aattatgcgc tggcgactca ggtagagttt accgacccgg aaattgttgc     180
tgagtacatc acgtatcctt cgccaaatgg tcacggcgag gtgcggggtt atctggtgaa     240
gcccgcaaag atgagcggca aaacgccagc cgtagtggtg gtgcatgaga atcgtggact     300
gaatccgtat atcgaagatg tggcacggcg agtggcgaag gcggggtata tcgccctggc     360
acctgacggc ttaagttccg ttggaggtta tccgggaaat gatataaagg tggtatccgc     420
agcggcccc                                                            429




<210> 38
<211> 556
<212> DNA
<213> Homo sapiens




<400> 38
gagaataacc tagacgttat tgacttgatg ccccgcgtcg gtaaggcgct ggataccacg      60
cagcgcggcg tgctgtttaa tgcagtaacc cgatggggca attaagtgaa acagagacat     120
ggcaattcct tgctgacaac agaaacgaaa tgtatatcat gccgcttagg tgtgccgttg     180
tcacctcaac ggcgattcca ggctataagg atagaagaag tgaaattgag atggttttgcc     240
tttttgattg tgttattagc gggttgttca tcaaagcatg actatacgaa cccgccgtgg     300
aacgcgaaag ttccggtgca acgtgcgatg cagtggatgc caataagcca gaaagccggt     360
gcagcctggg gcgtcgatcc acaattgatc acggcgatta tcgctatcga atcgggtggt     420
aatccgaacg cggtgagtaa atcgaatgcc attggtttga tgcagttaaa agcttcaacc     480
tccggacgtg atgtttatcg ccgtatgggc tggagtggtg agccgacgac cagcgagctg     540
aagaattcct caagac                                                    556




<210> 39
<211> 890
<212> DNA
<213> Homo sapiens




<400> 39
accacgctgc aggaattcgg cacgaggcca aaccaaagag aagtttttat gctgccaggg      60
atttgtacaa gtaccgacac cagtacccaa acttcaaaga tatccgatat caaaatgact     120
tgagcaatct tcgtttttat aagaataaaa ttccattcaa gccagatggt gtttacattg     180
aagaagttct aagtaaatgg aaaggagatt atgaaaaact ggagcacaac cacacttaca     240
ttcaatggct tttccccctg agagaacaag cttgaactt ctatgccaaa gaactaacta     300
catatgaaat tgaggaattc aaaaaaacaa aagaagcaat tagaagattc ctcctggctt     360
```

```
ataaaatgat gctagaattt tttggaataa aactgactga taaaactgga aatgttgctc    420
gggctgttaa ctggcaggaa agatttcagc atctgaatga gtcccagcac aactatttaa    480
gaatcactcg tattcttaaa agccttggtg agcttggata tgaaagtttt aaatctcctc    540
ttgtaaaatt tattcttcat gaagctcttg tggagaatac tattcccaat attaagcaga    600
gtgctctaga gtattttgtt tatacaatta gagacagaag agaaaggaga aagctcctgc    660
ggttcgccca gaaacactac acgccttcag agaactttat ctggggaccg cctcgaaaag    720
aacagtcgga gggaagcaaa gcccagaaaa tgtcttcccc tctcgcctcc agtcataaca    780
gtcaaacttc tatgcacaaa aaagccaagg actccaaaaa ttcctcctca gctgttcatt    840
taaatagcaa aacagctgaa gacaaaaaag tggcaccaaa agagcctgtg              890
```

```
<210> 40
<211> 393
<212> DNA
<213> Homo sapiens
```

```
<400> 40
accggctgcc atcttagtct agggactgag gagtcgccgc cgccccgagt cccggtacca     60
tgcatttcac ggtggccttg tggagacaac gccttaaccc aaggaagtga ctcaaactgt    120
gagaacttca ggttttccaa cctattggtg gtatgtctga cagtggatca caacttggtt    180
caatgggtag ccctcaccatg aaatcacagc ttcagatcac tgtcatctca gcaaaactta    240
aggaaaataa gaagaattgg tttggaccaa gtccttacgt agaggtcaca gtagatggac    300
agtcaaagaa gacagaaaaa tgcaacaaca caaacagtcc caagtggaag caacccctta    360
cagttatcgt tacccctgtg agtaaattac att                                 393
```

```
<210> 41
<211> 437
<212> DNA
<213> Homo sapiens
```

```
<400> 41
gcattccttg aaagaaatgt tacagccaga tcacagcgca gaacgataaa atggcacaat     60
ccaacaacaa ttttacattt tcgcgaccgc tttggctgct ttcaggtccg tttcaatgat    120
atactgccag tcgttaattc aaaaatagtt gataattaca acaatctatt gaattgaaac    180
gctttccttc gtaattcgca actggaacac gcacgctatg agtaaaccca ttgtgatgga    240
acgcggtgtt aaataccgcg atgccgataa gatggccctt atcccggtta aaaacgtggc    300
aacagagcgc gaagccctgc tgcgcaagcc ggaatggatg aaaatcaagc ttccagcgga    360
ctctacacgt atccagggca tcaaagccgc aatgcgcaaa aatggcctgc attctgtctg    420
cgaggaagcc tcctgcc                                                   437
```

```
<210> 42
<211> 392
<212> DNA
<213> Homo sapiens
```

18

```
        <400> 42
tcccctgcgt caattttcct gacagagtac gcgtaataac caaatcgcgc aacggaaggc      60
gacctgggtc atgctgaagc gagccaccag gagacacaaa gcgaaagcta tgctaaaaca     120
gtcaggatgc tacagtaata cattgatgta ctgcatgtat gcaaaggacg tcacattacc     180
gtgcagtaca gttgatagcc ccttcccagg tagcgggaag catatttcgg caatccagag     240
acagcggcgt tatctggctc tggagaaagc ttataacaga ggataaccgc gcatggtgct     300
tggcaaaccg caaacagacc cgactctcga atggttcttg tctcattgcc acattcataa     360
gtacccatcc aagagcacgc ttattcccca gg                                   392
```

```
        <210> 43
        <211> 555
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 43
tggctcgcgc gtcataatgg gagtttttgat actgtggatt gccggttcga tgtggtagcc      60
ttcaccggga atgaggttga gtggattaag gatgcctta atggccactc ataattaagg     120
tttaaggatt agcgtgcaag aaagaattaa agcttgcttc actgaaagca ttcaaactca     180
aattgcggcg gcagaggcgc ttccggatgc catctcccgt gcagccatga cgctggttca     240
gtctctgctc aatggcaaca aaatcctctg ttgtggtaat ggaacttccg ctgccaatgc     300
acagcatttt gctgccagca tgatcaaccg tttcgaaacg gagcggccca gcttacctgc     360
cattgcacta aatactgata atgttgtctt aacggcgatt gccaacgatc gcttacatga     420
tgaagtgtat gcaaaacagg tgcgggcgct gggtcatgcg ggagatgtat tgttagccat     480
ttccacccgt ggcaacagcc gcgatattgt taaagcagtt gaagccgccg ttacgcgtga     540
tacgaccatt gtggc                                                     555
```

```
        <210> 44
        <211> 553
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 44
ctatgacctg attacaattc aggtccgacc cgagatctcc aaaatgccag gacgctgtgg      60
ctacacaagc taaccatgct gattaatgaa aagaaactca acatgatgaa tgccgagcac     120
cgcaagctgc ttgagcagga gatggtcaac ttcctgttcg agggtaaaga ggtgcatatc     180
gagggctata cgccggaaga taaaaaataa aaacagtgcc ggagcacgcc tccggcaact     240
tgcataaaaa caaacacaac acgcacccgg aatgatgaaa aaatatctcg cgctggcttt     300
gattgcgccg ttgctcatct cctgttcgac gaccaaaaaa ggcgatacct ataacgaagc     360
ctgggtcaaa gataccaacg gttttgatat tctgatgggg caatttgccc acaatattga     420
gaacatctgg ggcttcaaag aggtggtgat cgctggtcct aaggactacg tgaaatacac     480
cgatcaatat cagacccgca gccacatcaa cttcgatgac ggtacgatta ctatcgaacc     540
catccccggg aca                                                       553
```

```
<210> 45
<211> 310
<212> DNA
<213> Homo sapiens




<400> 45
tctcgttacg acttcgagcg ttggacccgg ggatctctct actatcgctg caagcgagcc      60
agaaaaaact ggatgaactg atcgaacagc actaaaccca ggacaggaat ccgcaatgaa     120
caggcttttt tcaggtcgtt ccgatatgcc ctttgcgctg ctgcttctcg cgcccagctt     180
attactgctg ggcggtctgg tggcgtggcc gatggtgtcg aatatcgaaa tcagtttttt     240
acgtctgccg ctcaatccca acatcgagtc aacgtttgtt ggggtgagca actatgtgcg     300
tatcctctcc                                                           310




<210> 46
<211> 627
<212> DNA
<213> Homo sapiens




<400> 46
ctcgctgact cgcttcgctt ccccgacgcg ctgggttccc ggagcgcaga gcccagcgtt      60
agcgggtggg ctccccgagg ccccctgccc tcgccgggct gctccagggt gtcgctcctc     120
tggctgctcc cgaaggggct tctggccctg aggacggtgg tgccaagcga acttcatttt     180
taaaaagaac tggtggatga gaagagcgag cgaggcgag ctatggaccc tgtgagtcag     240
ctggcctctg cgggcacctt ccgggtgctg aaggagcccc ttgccttcct gcgagccctg     300
gaattgcttt ttgcaatctt tgcatttgca acatgcggtg gctattctgg aggcctgcgg     360
ctgagtgtgg actgcgtcaa caagacagaa agtaacctca gcatcgacat agcgtttgcc     420
tacccattca ggttgcacca ggtgacgttt gaggtccca cctgcgaggg aaaggaacgg     480
cagaagctgg cattgattgg tgactcctcg tcttcagcag agttcttcgt cactgttgct     540
gtcttcgcct tcctctactc tttggctgcc actggtcgtt acattttctt tcacaacaaa     600
aaccgggaaa caaccgggg cccactg                                         627




<210> 47
<211> 998
<212> DNA
<213> Homo sapiens




<400> 47
acctgggcac cgtgtcctat ggcgccgaca cgatggatga gatccagagc catgtcaggg      60
actcctactc acagatgcag tctcaagctg gtggaaacaa tactggttca actccactaa     120
gaaaagccca atcttcagct cccaaagtta ggaaaagtgt cagtagtcga atccatgaag     180
ccgtgaaagc catcgtgctg tgtcacaacg tgaccccgt gtatgagtct cgggccggcg     240
```
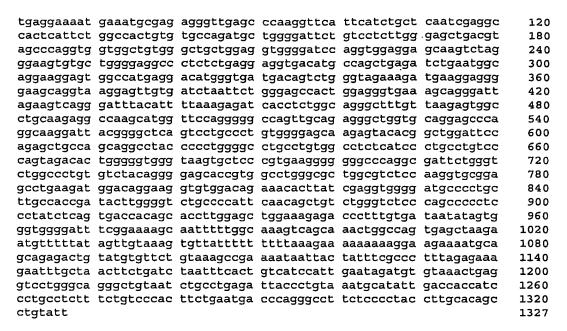
```
ttactgagga dactgagttc gcagaggctg accaagactt cagtgatgag aatcgcacct   300
accaggcttc cagcccggat gaggtcgctc tggtgcagtg gacagagagt gtgggcctca   360
cgctggtcag cagggacctc acctccatgc agctgaagac ccccagtggc caggtcctca   420
gcttctgcat tctgcagctg tttcccttca cctccgagag caagcggatg ggcgtcatcg   480
tcagggatga atccacggca gaaatcacat tctacatgaa gggcgctgac gtggccatgt   540
ctcctatcgt gcagtataat gactggctgg aagaggagtg cggaaacatg gctcgcgaag   600
gactgcggac cctcgtggtt gcaaagaagg cgttgacaga ggagcagtac caggactttg   660
aggtgagccg actcccaggc atcccatcct cctacgacgg tgccttcctt acgctgaaat   720
tagttcttcc tgtctttgta tgaaattaga gctgggatcg ctatagtcta ggagtgaagg   780
cagcttcgct cagcaggagc atggggggga tcctgtctgca tttctgtttc caccattct    840
ccagcttgct ggggaaggag ggttacagaa gcaaagaagt gccagtttcc ttagaattgt   900
gcttgataac tcctcaatga tcacacgcca gccgagctga gtacacataa gagtatgtgc   960
acataggcgc ctcccctct gtccccagag cccatgcg                           998
```

```
<210> 48
<211> 864
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(864)
<223> n = a,t,c or g
```

```
<400> 48
tttttttttt ttgagacaca gtctggctat gtcacccagg ctgagtacag tagcatgatc    60
ctggttcgct gcaacctcca cctcccaggc tcaagtgatc ctcccacctc agcctcctga   120
gtagctagga ctacaggtac gtgccacaac acctggctaa ttttttttatt ttttgtagag  180
acaagggtct ccctacgttg tccaggctgg acttgaactc ctgggttcaa gcgatcctac   240
caccttggcc tcccacagca ctggggttac aggcaggagc cactgcacct ggccctgtct   300
ttactgatgg tcctgcccca tgcctcccac acctaaccct gggcacccac tcccgaagct   360
ctcctactgg ctgcagggtc tgcctctgtg aggacagtga agccgatgac acgggaggtg   420
aagtcgaagg ccgtctgctg gccatccgtgg atcactgaga tgcagtggcg gtccccgtag   480
ctggcccgtg gcatgccacc ctggaagatg gtgaagggca acccctgcct agtggtcagc   540
cagaggattc tggtaatcgc tttgcaagga aagggaccgt aaggcacgag gctgcggagg   600
ggctctggtt gctgggcttc gctggacacg ggccacctgc cagtagctgc cgtcagagtg   660
acagctgacg agcaggcggc cgtcccgctg ccaccagatg ttctccagtt gctggctgct   720
gaggaagtgg tagagcacgc ggctgccctg taggtcccag atgacaacga ggcctcggct   780
gtagccgatc aggatctggt tggggtcttc aggtgcttcc tgcatgcttt caccatttng  840
aacaaacagc cggtgggggc cctc                                           864
```

```
<210> 49
<211> 1327
<212> DNA
<213> Homo sapiens
```

```
<400> 49
tttcgtgagc atttgagggc tgtttatgat ctatggggta aaactctctg actgactgga    60
```

```
tgaggaaaat gaaatgcgag agggttgagc ccaaggttca ttcatctgct caatcgaggc    120
cactcattct ggccactgtg tgccagatgc tggggattct gtcctcttgg .gagctgacgt    180
agcccaggtg gtggctgtgg gctgctggag gtggggatcc aggtggagga gcaagtctag    240
ggaagtgtgc tggggaggcc ctctctgagg aggtgacatg ccagctgaga tctgaatggc    300
aggaaggagt ggccatgagg acatgggtga tgacagtctg ggtagaaaga tgaaggaggg    360
gaagcaggta aggagttgtg atctaattct gggagccact ggagggtgaa agcagggatt    420
agaagtcagg gatttacatt ttaaagagat cacctctggc agggctttgt taagagtggc    480
ctgcaagagg ccaagcatgg ttccaggggg ccagttgcag agggctggtg caggagccca    540
ggcaaggatt acggggctca gtcctgccct gtggggagca agagtacacg gctggattcc    600
agagctgcca gcaggcctac cccctggggc ctgcctgtgg cctctcatcc ctgcctgtcc    660
cagtagacac tgggggtggg taagtgctcc cgtgaagggg gggcccaggc gattctgggt    720
ctggccctgt gtctacaggg gagcaccgtg gcctgggcgc tggcgtctcc aaggtgcgga    780
gcctgaagat ggacaggaag gtgtggacag aaacacttat cgaggtgggg atgcccctgc    840
ttgccaccga tacttggggt ctgccccatt caacagctgt ctgggtctcc cagccccctc    900
cctatctcag tgaccacagc accttggagc tggaaagaga ccctttgtga taatatagtg    960
ggtggggatt tcggaaaagc aattttttggc aaagtcagca aactggccag tgagctaaga   1020
atgttttat agttgtaaag tgttatttt ttttaaagaa aaaaaagga agaaaatgca   1080
gcagagactg tatgtgttct gtaaagccga aaataattac tatttcgccc tttagagaaa   1140
gaatttgcta acttctgatc taatttcact gtcatccatt gaatagatgt gtaaactgag   1200
gtcctgggca gggctgtaat ctgcctgaga ttaccctgta aatgcatatt gaccaccatc   1260
cctgcctctt tctgtcccac ttctgaatga cccagggcct tctcccctac cttgcacagc   1320
ctgtatt                                                              1327
```

```
        <210> 50
        <211> 436
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 50
ctgtcgtgca attccgagca ggcactgctc agtctggtgc ctgtgcagag ggagctactt     60
cgaaggcgct atcagtccag ccctgccaag ccagactcca gcttctacaa gggcctaggt    120
acctgccctt cccagctgag gctttctgag cccccaccga ccccagaca cctcagcgta    180
gcctctgtct cccatcacat gttccctct catcgctccc tttgcccaca tcttccagac    240
ttcttcgccg ccccattccc atcagacaat ctcccctaca ccctccagtc cccttttcccc    300
tcacctcctc cagctactcc ctctgaccat gctcttatcc tccaccacag acttaaatgg    360
gggcccagat gaccctctgc agcagacagg ccagctcttc gggggcctgg tgcgtgatat    420
ccggcgccgc tacccc                                                    436
```

```
        <210> 51
        <211> 481
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 51
tcgcctagca gtaagttggt tggcatgtgg tgggcaggca gggctggcag tagtcggacc     60
acttcagtct ccctgctctg ccttccccag caccattcgg tgcctcgaac ctcctggtga    120
accccctgga gccccaaaat gcagataaga tcaagatcaa gatcgcagac ctgggcaacg    180
cctgctgggt ggtatgagca agtgtgggag agcagagtgg ggggccctgc tccaagggtg    240
```

22

```
gaggcacagg gccgctcttg gggagcccta ccccagtctg cagtgcacgt gaaccgtcgg    300
ctgggtgggc actggtcctg cccagtcaac agcactgggg ccatggccaa gggcaggggc    360
cactaggaag ggatcagcct cagcctcaga tcactgggcc tgtccctctt ggaggacctg    420
gggaccccga ggctcacagc aaaccccact gagcttctcg ggtaggcgga tcggggtggg    480
g                                                                     481
```

```
        <210> 52
        <211> 435
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 52
cccgggtcga cccacgcgtc cgagctcctc gttgtggaga caagatcaaa aatcatatgt     60
atagaatgtg actgtggctc ccttaaagat tgtgccagtg atagatgttg tgagacctct    120
tgtacccttt ctcttggcag tgtttgcaat acaggacttt gctgccataa gtgtaaatat    180
gctgcccctg gagtggtttg cagagacttg ggtggtatat gtgatctacc ggaatactgt    240
gatgggaaaa aggaagagtg tccaaatgac atctacatcc aggatggaac cccatgttca    300
gcagtatctg tttgtataag aggaaactgc agtgaccgtg atatgcagtg tcaagccctt    360
tttggctacc aagtgaaaga cggttcccca gcgtgctatc gaaaattgaa taggattggt    420
aaccgatttg gaacg                                                     435
```

```
        <210> 53
        <211> 728
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 53
ccgggtcgac ccacgcgtcc ggacgccagt ttagcccagg tccacggact acaatgtttc     60
gtattcctga gtttaaatgg tctccaatgc accagcggct tctcactgat ttactatttg    120
cattagaaac tgatgtacat gtttggagga gcccattcta caaagtctgt aatggatttt    180
gtcaatagca atgaaaatat tatttttgta cataacacaa ttcacctcat ttcccaaatg    240
gtagacaaca tcatcattgc ttgtggagga attttacctt tgctctctgc tgctacatca    300
ccaactggtt ctaagacgga attggaaaat attgaagtga cacaaggcat gtcagctgag    360
acagcagtaa ctttcctcag ccggctgatg gctatggttg atgtacttgt gtttgcaagc    420
tctctaaatt ttagtgagat tgaagctgag aaaaacatgt cttctggagg tttaatgcga    480
cagtgcctaa aattagtttg ttgtgttgct gtgagaaact gtttagaatg tcggcaaaga    540
cagagagaca ggggaaataa atcttcccat ggaagcagta aacctcagga agttcctcaa    600
agtgtgactg ctacagcagc ttcgaagact ccattggaaa atgttccagg taacctttct    660
cctattaagg atccggatag acttcttcag gatgttgata tcaatcgcct tcgtgctgtt    720
gtctttcg                                                             728
```

```
        <210> 54
        <211> 2228
        <212> DNA
```

23

<213> Homo sapiens

<400> 54
tttttttttt ttcctgaaat gtaaattgtt tttaatatat ttaagagcac acagaagtct   60
tgatttataa aaaaataaat atataacatg acaaatttac tgatgatcct ggagctctga   120
ggtcaaactc tttaaatgat cagtgaaaac ataaaacatc catgatctgt taacacacac   180
aggagcatat tccagttgta aaaaacaaat tccttgaagg ctcagaacga acaaaaatca   240
gtctttatgg cagaaagcac atccaaagct aggcaatgaa gttcagcctg ggccacgtga   300
acctttcacc agccagccta taacctatgg agccaggaca ggaaagcatg atccttcagc   360
tcatgacgcc acccaggctt ccagacaact gcagaatgaa agagtccctc agaggctccc   420
cagcccctgc tgccatcata aagcacggga gggattgttt tgtccttagc ggctctgtcc   480
taaatttgag agcaggagac tgagaaggtt atgctcatta aatattgtca ttgtaacacg   540
gaatggaaat catgatcctt gcccatgggc actgagctga aagaaagagg aacctcacat   600
gaggctttcc tagagaccag gatgttgggt gagtgggcgt gcacttctca agtgggcaag   660
gaagaactgc ttttctccag ctgacatgct ctcaggggtg aagaagttta gcttaaaata   720
cctgatggcg ctgcataaac tggggatttg ggaactgagt ttttagctct gtgacacaca   780
acataaaaaa caaaaatcca gtctcattag ctaaattcgg attaaaatct gaaatgtttt   840
tatggagttg ccaacaggct ggaatgtacc tgatacaatt taatctgctt ttatttcttt   900
ggctgtcttc caaaccactt tcttcctgta attcttaagt tggctagttc tccttcctca   960
gaaaaattac ccctaagaat cttcctaata gtgagggtgt acttccgaat agaagagtcc   1020
ttcggctgaa atggcatctc caaggcctac agttcgaatg gggtctttac acaccaatac   1080
tggtgtgaag tggaaggata ttccctctct gtgccattct actactggct tgtttgggtt   1140
taatacaatc ctggagcctg cctccgaatg ggaagtcatg aactcttggg gtgccctcag   1200
agacactcgg ctggtgtcta tggtttctgt ggcgcaggcc tgtgtcccag ccacacgagc   1260
tcctgcagcc acggctgcca gctggttggc ccagtgtcca tccacagttg ccaggatgtg   1320
gtagaccagc gtgtggaaat ggatcctggt gagatccgag gctctgcttt tactcctccc   1380
atgttctttc aagatccaga agaggatgtc actgaccatg cccacatcag gaacaccgtt   1440
ccaggaagag agagaagagt gaggtccaga ggctgactgg gtgagaaata acagctcctg   1500
ttcattcagc ccaagggaag tcaccgcggg aaagacctgc tgaaggaaca atgctgctca   1560
tgagctccct gttagtcata ctggcccagc tctaggtgaa actggaatac cagtgggggat   1620
gtcagaaatg gaggttacaa cctccaagag tctcttcctc tggagctcct tgctttgtcc   1680
ctccatcatg tgcaatccag agaggccccc caggtctggc tgaaactcct ccaggctaga   1740
cacaaacacc tccagcatat tcatggcccc gttggagagg tcgtgagaga agatgaatcg   1800
gttggcatgg ggagctttta actggcccca ctcctcccct gcttgatact ctaaaatgag   1860
gtggaactca tccacttcct gcaatgactc tggtggaaca aagacattgt catcaagaag   1920
ctcatgtagc tttggaccaa ctggaccgca aagaagaacc tttaaatctg agttggctgc   1980
aaatttctgt ccaattaaag ctgcatttcc tcctacatag tgctgggctc ctgggaactc   2040
tgacgcaacc tgggcaatgt cgtgaaaagt ttccttatca ctgaagaagc gctcagcagc   2100
tgctcccttc cccatgaagt gaatgaaggc ttcttccaga tcattccttg aatgcagaat   2160
gctgtgatct ttcccattcc caggactaag gccaagtgcc tgcaagagct tcacccctga   2220
ggaattca   2228

<210> 55
<211> 405
<212> DNA
<213> Homo sapiens

<400> 55
gcaggagttc aagaccaacg tggccaacat ggggaaagcc catcactact aaaaatacaa   60
aaactagcca ggcgtggtga cacacatctg taatcccagc tactcgaggc gctgaggcag   120
gagaatcact tgaaccagga ggcagaggtt gcagtgagcc gagatcatgc cactgcactc   180
cagcctgggc cacagagcaa gactccatct gacaactagc tgttccagcc cccagccact   240

```
tgagtcatct cagctgaggc cccacacacc aagaagcaga ggtgagtcta atccacagag     300
ccctggtcag acatgatgac ggtggcttca cccggggggtc tccgcacagc agcggcctcg     360
ggtaagcaga acctcgctcc ggggtttaca aatccttcct cgtgc                     405
```

```
<210> 56
<211> 1652
<212> DNA
<213> Homo sapiens
```

```
<400> 56
actaggggag gtgctcaagt gccagcaggg cgtatccagt ctggcctttg ccctggcctt      60
cttgcagcgc atggacatga agccgctggt ggtcctgggg ctgccggccc ctacggctcc     120
ctcgggctgt ctttccttct gggaggccaa ggcgcagctg gccaagagct gcaaggtgct     180
ggtagacgcg cttcgacaca cgccgccgc tgctgtgcca ttttttggcg gcgggtctgt      240
gctacgcgct gccgagccgg ctccccatgc cagctacggc ggcatcgtct cggtggagac     300
agacctgctg cagtggtgcc tggagtcggg cagcatcccc atcctgtgcc ccatcgggga     360
gacggccgcg cgccgctccg tgcttctcga ctccctggag gtgaccgcgt cgctggccaa     420
ggcgctgcgg cccaccaaaa tcatcttcct caataacaca ggcggcctgc gcgacagcag     480
tcataaggtc ctgagtaacg tgaacctgcc cgccgacctg acctggtgt gcaacgccga      540
gtgggtgagc acaaaagaac ggcagcagat gcggctcatc gtggacgtgc tcagccgcct     600
gccccaccac tcctcggccg tcatcaccgc cgctagcacg ctgctcactg agctctttag     660
caacaagggg tccgggaccc tgttcaagaa cgccgagcga atgctacggg tgcgcagcct     720
ggacaagctg gaccagggcc gtctagtgga cctggtcaac gccagcttcg gcaagaagct     780
cagggacgac tacctggcct cgctgcgccc gcggctgcac tccatctacg tctccgaggg     840
gtacaacgcc gccgccattc tgaccatgga gcccgtcctg ggggggcaccc cgtacctgga     900
caaatttgtg gtgagctcca gccgccaggg ccaaggctcc ggccagatgc tgtgggagtg     960
cctgcggcgg gaccttcaga cacttttctg gcgctcccgg gtcaccaacc ccatcaatcc    1020
ctggtacttc aaaacacagtg atggcagctt ctccaacaag cagtggatct tcttctggtt    1080
tggcctggct gatatccggg actcctatga gttggtcaac cacgccaagg gactgccaga    1140
ctcctttcac aagccagctt ctgacccagg cagctgaccc tcaccatgga cactacaggc    1200
cctggaatgg ccagggtgga ccaaaagcca tgcccagctg ggcatgaccc caggcagcca    1260
gccacaggct gaaggggggct tgttggctga gtgatctgca gaggagaaag cagcccccag    1320
ctctgcccca gaggaggcgc tgaagtggga caagcacagg aaagaagggg accagtctag    1380
gaccccaact tgactcactc taaagctaca accaaatggc cttcgatttt caacctgggg    1440
attaggggag gggagggtgc cttccagggc tcttactcag gacttaaccc ttaagggtga    1500
gcttagtttc tgtcctcttg tgcttatgtt ttgaggctcc cttacccaaa ataataccc     1560
tgcctgcgtg atattctacc attcatttta attcctttgg gtcttgcagt ttttcaggag    1620
gccttgatta aaatgcaaat acttgtctga ga                                  1652
```

```
<210> 57
<211> 1129
<212> DNA
<213> Homo sapiens
```

```
<400> 57
tttttttttt ttgagacgga gtctcgctct gtggcccagg ctggagtgca gtggcgcgat      60
ctcggctcac tgcaagctcc gcctcccggg ttcacgccat tctcctgcct cagcctcccg     120
agtagctggg actacaggcg cccgctacca cgcccggcta atttttttgta tttttagtag    180
```

```
agacggggtt tcaccgtgtt agccaggatg gtctcgatct cctgacctcg tgatccgccc    240
gcctcggcct cccaaagtgc tgggattaca ggcgtgagcc accgcgcccg gcccatttac    300
taaatgttaa gttccttata attccatctc tttcagcacc caatacaggg gtttacatag    360
aggaagtact caatatttcc tttcttttt tctttttttt ctggagatag tctcgctctg    420
tcaccaggct ggagtgcagt ggcgtaatct cggctcactg caacctccac ctcctgggtt    480
cacgccattc tcctgcctca gcctcccgag tagctgggac tacaggcgcc caccatcacg    540
cccggctaat tttttttgta ttttagtag agatggggtt tcaccgtgtt agccaggatg    600
gtctcgatct cctgaccttg tgatccgccc gcctcggcct cccaaagtgc tgggattaca    660
ggtgtgagcc accgcgcccg gcctaaaaaa attttttttt tcttgagaca aagtcttgct    720
ctgttgccca ggctgaagtg caggggcatg atatcagctc attgcaacct ccacctcccg    780
ggttcaagcg attctcctgc ctcagcctcc cgagtagctg ggattacagg tgccctccgc    840
cacgtccagc taattttctg ttttttagta gagacggggt ttcaccgtgt tagccaggat    900
ggtctcgatc tcctgacctc gtgatccacc tgcctcagcc tcccaaagtg ctgggattac    960
aggcgtgagc cactgagccc agccccattt tatttcattt ctctaacagc aatgatatat   1020
atacatccca tagtatatcc tactgatata atagccccct tccccattca acacctgtgt   1080
aatcaggaaa taaaaccctc gtgcagcatt ggcgtctgga tagtcctcg             1129
```

```
        <210> 58
        <211> 475
        <212> DNA
        <213> Homo sapiens




        <400> 58
        gttccgccca attggcataa tacgccaagc cctgtgctct gcagacggcc accagagaag    60
        gatccttact ctgcgcctgg gattgctcgt tatcccgttt ctccccgcaa gtaacctgtt   120
        cttccgagtg ggcttcgtgg tcccgagcgt ggggtgctgt gtgatgctgc ttttttggatt  180
        cggagcctgc gcaaacacac cgagaaaaag aagctcatcg ctgccgtggt gctgggaatc   240
        ctactcagca agatgctgag aggctgagat gcgcggtgcg cggcggcgag tggcggagcg   300
        aggggcggtt ttcagaggcg ctgtgtctgt gtgtcccctc agtgctgagg ttcgctgcaa   360
        catcggcaga aacctggctg ctaaaggcaa ccaaacgggc gccatcagat accaccggga   420
        agctgtaagc ttaaatccca agacgaaatc gtcgacacgg gaattccggc cttgc         475




        <210> 59
        <211> 711
        <212> DNA
        <213> Homo sapiens




        <400> 59
        ggaaaatagc agattttggg ttcagtaacc tcttcactcc tgggcagctg ctgaagacct    60
        ggtgtggcag ccctccctat gctgcacctg aactctttga aggaaaagaa tatgatgggc   120
        ccaaagtgga catctggagc cttggagttg tcctctacgt gcttgtgtgc ggtgccctgc   180
        catttgatgg aagcacactg cagaatctgc gggcccgcgt gctgagtgga aagttccgca   240
        tcccattttt tatgtccaca gaatgtgagc atttgatccg ccatatgttg tgtgttagatc   300
        ccaataagcg cctctccatg gagcagatct gcaagcacaa gtggatgaag ctagggacg    360
        ccgatcccaa ctttgacagg ttaatagctg aatgccaaca actaaaggaa gaaagacagg   420
        tggacccct gaatgaggat gtcctcttgg ccatggagga catgggactg gacaaagaac    480
        agacactgca gtcattaaga tcagatgcct atgatcacta tagtgcaatc tacagcctgc   540
        tgtgtgatcg acataagaga cataaaaccc tgcgtctcgg agcacttcct agcatgcccc   600
```

26

```
gagccctggg  cctttcaagc  accagtcaat  atccaggcgg  agcaggcagg  tactgctatg      660
aacatcagcg  ttccccaggt  gcagctgatc  aacccagaga  accaaattgt  g                711
```

```
        <210> 60
        <211> 344
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 60
ggcacgagaa  tttttaggcc  accgagcttc  tataacatgg  tcatgagctc  gggtgcacca       60
tagatttccc  aaagctgagg  ttgcataacc  cctctgctga  ggacagatct  taccgaagat      120
cgcacgaagt  gctgccatgg  agatctgctt  gaatgcgctg  atgacagggc  agaccttgtc      180
gaggatatct  gggaaaatca  agattcaatc  tccactatac  tgattgaatg  ctgtgaaaaa      240
cctctgttgg  aaaaatccca  ctgcattgcc  gaagtggaaa  atgatgagat  gcctgctgac      300
ttgccttcat  tagctgctga  ttttgttgaa  agtaaggatg  tttg                        344
```

```
        <210> 61
        <211> 594
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 61
gcttgagctc  gagcgacggc  gctggcggag  acgccggctg  ctcctcccct  ccccgccgct       60
tttcctaaaa  ggattgtaca  ccttagaagt  gcttaaggaa  gagtgatgaa  gctctgaatc      120
gtgtcctgca  gcagattctg  agtgccaccc  aagatgaaga  gagggacaag  cttgcatagt      180
aggcggggca  agccagaggc  cccaaaggga  agtccccaaa  tcaacaggaa  gtctggtcag      240
gagatgacag  ctgttatgca  gtcaggccga  cccaggtctt  catccacaac  tgatgcacct      300
accggctctg  ctatgatgga  aatagcttgt  gctgctgctg  ctgctgctgc  tgcatgtcta      360
ccaggagagg  agggaactgc  ggagcggatc  gaacggttgg  aagtaagcag  ccttgcccaa      420
acatccagtg  cagtggcctc  cagtaccgat  ggcagcatcc  acacagactc  tgtggatgga      480
acaccagacc  ctcagcgcac  aaaggctgcc  attgctcacc  tgcagcagaa  gatcctgaag      540
ctcacagaac  aaatcaagat  tgcacaaaca  gcccgacgaa  atcgtcgacc  cggg            594
```

```
        <210> 62
        <211> 1609
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(1609)
        <223> n = a,t,c or g
```

27

<400> 62

```
cgaagttatg gccttcctta taaggaaaag gggtggattg gaggaatcgc caattgaagt      60
ttcgaaggat cgctttagct gaatatcaga gaaccttgtg aagatcttaa agagcaacta     120
aagcataaag aatttcttct ggctgctaat acttgtaacc gtgttggtgg tctttgtttg     180
aaatgtgctc agcatgaagc tgttctttcc caaacccata ctaatgttca tatgcagacc     240
atcgaaagac tggttaaaga aagagatgac ttgatgtctg cactagtttc cgtaaggagc     300
agcttggcag atacgcagca aagagaagca agtgcttatg aacaggtgaa acaagttttg     360
caaatatctg aggaagccaa ttttgaaaaa accaaggctt taatccagtg tgaccagttg     420
aggaaggagc tggagaggca ggcggagcga cttgaaaaag aacttgcatc tcagcaagag     480
aaaagggcca ttgagaaaga catgatgaaa aaggaaataa cgaaagaaag ggagtacatg     540
ggatcaaaga tgttgatctt gtctcagaat attgcccaac tggaggccca ggtggaaaag     600
gttacaaagg aaaagatttc agctattaat caactggagg aaattcagag ccagctggct     660
tctcgggaaa tggatgtcac aaaggtgtgt ggagaaatgc gctatcagct gaataaaacc     720
aacatggaga aggatgaggc agaaaaggag cacagagagt tcagagcaaa aactaacagg     780
gatcttgaaa ttaaagatca ggaaatagag aaattgagaa tagaactgga tgaaagcaaa     840
caacacttgg aacaggagca gcagaaggca gccctggcca gagaggagtg cctgagacta  .  900
acagaactgc tgggcgaatc tgagcaccaa ctgcacctca ccagacagga aaaagatagc     960
attcagcaga gctttagcaa ggaagcaaag gcccaagccc ttcaggccca gcaaagagag    1020
caggagctga cacagaagat acagcaaatg gaggcccagc atgacaaaac tgaaaatgaa    1080
cagtatttgt tgctgacctc ccagaataca tttttgacaa agttaaagga agaatgctgt    1140
acattagcca agaaactgga acaaatctct caaaaaacca gatctgaaat agctcaactc    1200
agtcaagaaa aaaggtatac atatgataaa ttgggaaagt tacagagaag aaatgaagaa    1260
ttggaggaac agtgtgtcca gcatgggagg agtacatgag acgatgaagc aaaggctaag    1320
gcaggtggat aagcacaggc aggccacagc ccaggaggtg gtgcaggtcc ccagaagcag    1380
gaccngcttc ttccnggaga gggaggggnct gtcggaagag gtgggnccgn cttggggncc    1440
nngttaccca gnatncncaa tcttttttgg ttgacccggt tggacagggt ggacttnant    1500
gtttttcaaa gggngnttttt cattccanct tgttttngct taatttngcn caacgnaccc    1560
acggcctncc cggnntgaaa cccccncccc tgaggggggg ttntcccccc               1609
```

<210> 63
<211> 615
<212> DNA
<213> Homo sapiens

<400> 63

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catcctatcc cgtgtggtgg aattcgccgc tgactgctga ggtgccaccc gagctgctgg      60
ctgctgccgg cttcttccac acaggccatc aggacaaggt gaggtgcttc ttctgctatg     120
ggggcctgca gagctggaag cgcggggacg acccctggac ggagcatgcc aagtggttcc     180
ccagctgtca gttcctgctc cggtcaaaag gaagagactt tgtccacagt gtgcaggaga     240
ctcactccca gctgctgggc tcttgggacc cgtgggaaga accggaagac gcagcccctg     300
tggccccctc cgtccctgcc tctgggtacc ctgagctgcc cacacccagg agagaggtcc     360
agtctgaaag tgcccaggag ccaggagggg tcagtccagc cgaggcccag agggcgtggt     420
gggttcttga gcccccagga gccagggatg tggaggcgca gctgcggcgg ctgcaggagg     480
agaggacgtg caaggtgtgc ctggaccgcg ccgtgtccat cgtctttgtg ccgtgcggcc     540
acctggtctg tggctgagtg tgcccccggc ctgcagctgt gccccatctg gcagaagccc     600
ccgtcccgca gccgg                                                       615
```

<210> 64
<211> 839

28

```
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(839)
<223> n = a,t,c or g




<400> 64
aagaatgtct ggaagagatg gaagaaaagg tttttgtat tggtgcaggt cattcagtac    60
acgtttgcca tgtgcagtta tcgggagaag aaagcggagc ctcaggaact tctacaattg   120
gatggctaca ctgtggatta caccgacccc cagccaggtt tggagggtgg ccgagccttc   180
ttcaatgctg tcaaggaggg agacaccgtg atatttgcca gtgacgatga acaagaccgc   240
atcctgtggg tccaggccat gtatcgggcc acggggcagt cacacaagcc tgtgcccccg   300
acccaagtcc agaaactcaa cgccaaggga ggaaatgtac ctcagctgga tgcccctatc   360
tctcaatttt acgcagatag agctcaaaaa catggcatgg atgaatttat ctcttccaac   420
ccctgtaact ttgaccacgc ttccctcttt gagatggtac aacgccttac tttggatcac   480
agacttaatg attcctattc ttgcctgggc tggttcagtc ctggccaggt gtttgtacta   540
gacgagtatt gcgcccgaaa tggagtccgg gggtgtcacc gacatctctg ctacctcaga   600
gacttgcttg aacgggcaga aaatggcgcc atgatcgacc ccaccctnt tcactacagc    660
tttgccttct gtgcatccca tgtccatggg aacaggcctg atggaattgg gaactgttga   720
ctgttgaaga aaaggaacgt tttttgaagg aaatcaaaag aggaggnttc cgnagttctg   780
ctaagaaaaa tcaggttaca acattttagg naattgcttt tcccatttgg gtcgaacct    839




<210> 65
<211> 1678
<212> DNA
<213> Homo sapiens




<400> 65
caagcagctg atcgtgctgg gaaacaaagt ggacctcctg ccccaggatg ctcctggcta    60
ccggcagagg ctgcgggagc gactgtggga ggactgtgcc cgcgccgggc tcctgctggc   120
ccctggccac caagggccac agcgccccgt caaggacgag ccacaggacg gggagaatcc   180
gaatccgccg aactggtccc gcacagtggt cagggacgtg cggctgatca gcgccaagac   240
cggctatgga gtggaagagt tgatctctgc ccttcagcgc tcctggcgct accgtgggga   300
cgtctactta gtgggcgcca ccaacgccgg caaatccact ctctttaaca cgctcctgga   360
gtccgattac tgcactgcca agggctccga ggccatcgac agagccacca tctcccccttg   420
gccaggtact acattaaacc ttctgaagtt tcctatttgc aacccaactc cttacagaat   480
gtttaaaagg catcaaagac ttaaaaaaga ttcaactcaa gctgaagaag atcttagtga   540
gcaagaacaa aatcagctta atgtcctcaa aaagcatggt tatgtcgtag aagagttgg    600
aaggacattc ttgtattcag aagaacagaa ggataacatt cccttttgagt ttgatgctga   660
ttcacttgcc tttgacatgg aaaatgaccc tgttatgggt acacacaaat ccaccaaaca   720
agtagaattg actgcacaag atgtgaaaga tgcccactgg ttttatgaca ccccctggaat   780
tacaaaagaa aattgtattt taaatcttct aacagaaaaa gaagtaaata ttgtttttgcc   840
aacacagtcc attgttccaa gaactttgt gcttaaacca ggaatggttc tgttttgggg    900
tgctataggc cgcatagatt tcctgcaggg aaatcagtca gcttggttta cagtcgtggc   960
ttccaacatc ctccctgtgc atatcacctc cttggacagg gcagacgctc tgtatcagaa   1020
gcatgcaggt catacgttac tccagattcc aatgggtgga aaagaacgaa tggcaggatt   1080
tcctcctctt gttgctgaag acattatgtt aaaagaagga ctgggggcat ctgaagcagt   1140
ggccgacatc aagttttcct ctgcaggttg ggtttcagta acacctaatt ttaaggacag   1200
actgcatctc cgaggctata cacctgaagg aacagttttg accgtccggc ccctctcttt   1260
gccatatatt gttaacatca aaggacagcg catcaagaaa agtgtggcct ataaaaccaa   1320
```

```
gaagcctcct tcccttatgt acaacgtgag gaagaagaaa ggaaagataa atgtatgaga    1380
ccgaccttgt tcactccaga tattaactgt attgaacaca acaaaataca ttgaatttgt    1440
attaaacata taacgcataa ataaagctcc cattcttacc cttaaaaata aaaggagaat    1500
gaaaaaaaaa gatgccaata ggcatatacg tggttttggg tattccgggg tcttcccgtg    1560
gtctgttcac tttgcggtgg tggtgatata ttaggcagtc ggggcgcctg atgtacgcct    1620
tcttatagag gtacatggtt ggatgcagcg tcttgacgtg ggattcgctt tattcgcc     1678
```

```
        <210> 66
        <211> 1888
        <212> DNA
        <213> Homo sapiens




        <400> 66
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gcccggagaa aactgaaggg tgccatcctc acgaccatgc ttgtctccag gaacttctca    120
gctgccaaaa gcctattgaa caagaagtcg gatggcggtg tcaagccaca gagcaacaac    180
aaaaacagtc tcgtaagccc agcccaagag cccgcgccct tgcagacggc catggagcca    240
caaaccactg tggtacacaa cgctacagat gggatcaagg gctccacaga gagctgcaac    300
accaccacag aagatgagga cctcaaagct gccccgctcc gcactgggaa tggcagctcg    360
gtgcctgaag acgggagctc ccgggacaga acagcccct ctgcaggcat gcagccccag    420
ccttctctct gctcctcagc catgcgaaaa caggagatca ttaagattac agaacagctg    480
attgaagcca tcaacaatgg ggactttgag gcctacacga agatttgtga tccaggcctc    540
acttcctttg agcctgaggc ccttggtaac ctcgtggagg ggatggattt ccataagttt    600
tactttgaga atctcctgtc caagaacagc aagcctatcc ataccaccat cctaaacccc    660
cacgtccacg tgattgggga ggacgcagcg tgcatcgcct acatccgcct cacccagtac    720
atcgacgggc agggtcggcc ttcgaaccca gccaagtcag aagaagaccc gggtctggca    780
cccgtcggga atggcaagtg gctcaatgtc cactatcact gctcagggc ccctgcccg     840
caccgctgca gtgagctcag ccacaggggc tttaggaga ttccagccgg aggtccgaac    900
cttcgcagcc agtggctctg gagggcctga gtgacagcgg ccagtcctgt ttgtttgaag    960
gtttaaaaca attcaattac aaaagcggca agcagccaat gcacgcccct gcatgcagcc   1020
ctcccgcccg ccttcgtgt ctgtctctgc tgtaccgagg tgttttttac atttaagaaa   1080
aaaaaaaag aaaaaaagat tgtttaaaaa aaaaaggaat ccataccatg atgcgtttta   1140
aaaccaccga cagcccttgg gttggcaaga aggcaggagt atgtatgagg tccatcctgg   1200
catgagcagt ggctcaccca ccggccttga agaggtgagc ttggcctctc tggtccccat   1260
ggacttaggg ggaccaggca agaactctga cagagctttg ggggccgtga tgtgattgca   1320
gctcctgagg tggcctgctt accccaggtc taggaatgaa cttctttgga acttgcatag   1380
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gacgttgctg tactgtcttg tttagtgtag aagggaagag aattggtgct gcagaagtgt   1560
acccgccatg aagccgatga gaaacctcgt gttagtctga catgcactca ctcatccatt   1620
tctataggat gcacaatgca tgtgggccct aatattgagg ccttatccct gcagctagga   1680
gggggagggg ttgttgctgc tttgcttcgt gttttcttct aacctgggca aggagagagc   1740
caggccctgg gcaaggctcc cgtgccgcct ttgggttcct tgtttcttg ttgcttgatc   1800
tggaccatct ttgtctttgc cttttcacgg tagggtcccc atgctgaccc tcatcttggg   1860
cctgggcctc ttgccaaagt tgcccctg                                      1888
```

```
        <210> 67
        <211> 1712
        <212> DNA
        <213> Homo sapiens
```

```
   <400> 67
ctttacccaa gaatgtggta ttcgtgcttg acagcagtgc ttctatggtg ggaaccaaac      60
tccggcagac caaggatgcc ctcttcacaa ttctccatga cctccgaccc caggaccgtt     120
tcagtatcat tggattttcc aaccggatca aagtatggaa ggaccacttg atatcagtca     180
ctccagacag catcagggat gggaaagtgt acattcacca tatgtcaccc actggaggca     240
cagacatcaa cggggccctg cagagggcca tcaggctcct caacaagtac gtggcccaca     300
gtggcattgg agaccggaga gtgtccctca tcgtcttcct gacggatggg aagcccacgg     360
tcggggagac gcacaccctc aagatcctca acaacacccg agaggccgcc cgaggccaag     420
tctgcatctt caccattggc atcggcaacg acgtggactt caggctgctg gagaaactgt     480
cgctggagaa ctgtggcctc acacggcgcg tgcacgagga ggaggacgca ggctcgcagc     540
tcatcgggtt ctacgatgaa atcaggaccc cgctcctctc tgacatccgc atcgattatc     600
cccccagctc agtggtgcag gccaccaaga ccctgttccc caactacttc aacggctcgg     660
agatcatcat tgcggggaag ctggtggaca ggaagctgga tcacctgcac gtggaggtca     720
ccgccagcaa cagtaagaaa ttcatcatcc tgaagacaga tgtgcctgtg cggcctcaga     780
aggcagggaa agatgtcaca ggaagcccca ggcctggagg cgatggagag ggggacacca     840
accacatcga gcgtctctgg agctacctca ccacaaagga gctgctgagc tcctggctgc     900
aaagtgacga tgaaccggag aaggagcggc tgcggcagcg ggcccaggcc ctggctgtga     960
gctaccgctt cctcactccc ttcacctcca tgaagctgag ggggccggtc ccacgcatgg    1020
atggcctgga ggaggcccac ggcatgtcgg ctgccatggg acccgaaccg gtggtgcaga    1080
gcgtgcgagg agctggcacg cagccaggac ctttgctcaa gaagccatac cagccaagaa    1140
ttaaaatctc taaaacatca gtggatggtg atccccactt tgttgtggat ttccccctga    1200
gcagactcac cgtgtgcttc aacattgatg ggcagccgg ggacatcctc aggctggtct    1260
ctgatcacag ggactctggt gtcacagtga acgagagtt aattggggca cccgcccctc    1320
caaatggcca caagaaacag cgcacttact tgcgcactat caccatcctc atcaacaagc    1380
cagagagatc ttatctcgag atcacaccga gcagagtcat cttggatggt ggggacagac    1440
tggtgctccc ctgcaaccag agtgtggtgg tggggagctg ggggctggag gtgtccgtgt    1500
ctgccaacgc caatgtcacc gtcaccatcc agggctccat agcctttgtc atcctcatcc    1560
acctctacaa aaagccggcg cccttccagc gacaccacct gggtttctac attgccaaca    1620
gcgagggcct ttccagcaac tgcagggtct tctgtgagtc tggcatcctg attcaggaac    1680
tgacccagca gtccgtggca gttgctggtc ga                                  1712
```

```
   <210> 68
   <211> 839
   <212> DNA
   <213> Homo sapiens
```

```
   <400> 68
gtttttctc gagcaggtta gccaatatac ctttgctatg tgcagttata gagaaaagaa      60
gtctgaacca caagaattaa tgcagcttga aggctatact gtggattata ccgatcccca     120
cccaggcctt cagggtggtt gtatgttctt taatgctgtt aaagaaggag atactgtaat     180
ctttgccagt gatgatgaac aggacagaat attatgggtt caagccatgt atagggccac     240
aggtcaatca tataaaccag ttcctgcaat tcaaacccag aaactgaatc ctaaaggagg     300
aactctccat gcagatgctc agctttatgc agatcgtttt cagaaacatg gtatggatga     360
gtttattct gcaaacccct gcaagcttga tcatgccttc cttttttagaa tactccagag     420
gcagactttg gatcacagac tgaatgattc ctattcttgc ttgggatggt ttagccctgg     480
ccaagtcttt gtgttagatg agtactgtgc ccgttatggt gtgagaggct gtcacagaca     540
tctctgctac cttgcagaac tgatggaaca ttcagaaaat ggtgctgtca ttgaccctac     600
cctgctccat tacagctttg cattctgtgc ctctcgatgt gcacggcaac aggcctgatg     660
gaattgggac tgtttcagtg aagaaaaag aaagatttga ggagataaaa gagagactct     720
cttccctttt agaaaatcag ataagccatt tcagatactg ttttcccttt ggacgacctg     780
aaggtgctct aaaagctaca ctttcattac ttgaaagggt tttaatgaaa gatattgcc     839
```

```
<210> 69
<211> 801
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(801)
<223> n = a,t,c or g
```

```
<400> 69
agacgggctg ctccatgagg tgctgaacgg gctcctagat cgccctgact gggaggaagc     60
tgtgaagatg cctgtgggca tcctcccctg cggctcgggc aacgcgctgg ccggagcagt    120
gaaccagcac gggggatttg agccagccct gggcctcgac ctgttgctca actgctcact    180
gttgctgtgc cggggtggtg gccacccact ggacctgctc tccgtgacgc tggcctcggg    240
ctcccgctgt ttctccttcc tgtctgtggc ctggggcttc gtgtcagatg tggatatcca    300
gagcgagcgc ttcagggcct tgggcagtgc ccgcttcaca ctgggcacgg tgctgggcct    360
cgccacactg cacacctacc gcggacgcct ctcctacctc cccgccactg tggaacctgc    420
ctcgcccacc cctgcccata gcctgcctcg tgccaagtcg gagctgaccc taaccccaga    480
cccagccccg cccatggccc actcacccct gcatcgttct gtgtctgacc tgcctcttcc    540
cctgccccag cctgccctgg cctctcctgg ctcgccagaa cccctgccca tcctgtccct    600
caacggtggg ggcccagagc tggctgggga ctggggtggg gctggggatg ctccactgtc    660
cccggaccca cagctgtctt cacctcctgg ctctcccaag gcagctctac actcacccgt    720
ctaaaaaaag gcccccgtaa ttcccccccga catgnnnccc cgctctagag gatcaagcaa    780
ctacgcggcg gctcacgacg c                                              801
```

```
<210> 70
<211> 531
<212> DNA
<213> Homo sapiens
```

```
<400> 70
agaagggtgt cccaaccttg ctcatggcag ctggcagctt ctatgacatt ctggccatca     60
ctggcttcaa cacatgcttg ggcatagcct tttccacagg ctctactgtc tttaatgtcc    120
tcagaggagt tttggaggtg gtaattggtg tggcaactgg atctgttctt ggatttttca    180
ttcagtactt tccaagccgt gaccaggaca aacttgtgtg taagagaaca ttccttgtgt    240
tggggttgtc tgtgctagct gtgttcagca gtgtgcattt tggtttccct ggatcaggag    300
gactgtgcac gttggtcatg gctttccttg caggcatggg atggaccagc gaaaaggcag    360
aggttgaaaa gataattgca gttgcctggg acatttttca gcccttctt tttggactaa     420
ttgggagcag aggtatctat ttgcatctct cagaccagaa actgtaggcc tttgtgttgc    480
caccgtaggc atttgcagta ttgatacgaa ttttgacta cattttctga a             531
```

```
<210> 71
<211> 540
<212> DNA
```

```
        <213> Homo sapiens




        <400> 71
tgtgcgagga attcgaatca ggtaatggag aggactggca tgaaggggggc acaggactgt    60
gaaaacctga gtgattctgt ccttccctca tcctctatcc ctgaaccagg gcagacatag   120
atggaatcag agcaggagtt ggtgttgatg tggtttcagg tccacctatc agagtttgag   180
agatttaggc catgaaccat tatgaatata gatgagaacc tttgtaattg ctgaaggagg   240
tagtagtgca ggcaagtcct gtgtgcaaga cctgctgctc ccagttagta cggacccctg   300
tgacattcac agaagttcag aatgtctgag atgctctgca ggctacctta tctccgtctg   360
cagctacacc tccagtgatc acaatcagtg ctacgctggc acagccagcc tggccctgct   420
ctggattgga ggcatcctca agggctgctt gctgtggaag cagtttcgct ggaccgagag   480
gagccactgg aattttgggt actgggcctt atggtcaccc gggaatggga atggctgctg   540




        <210> 72
        <211> 428
        <212> DNA
        <213> Homo sapiens




        <400> 72
cggacgcgtc cgcccacgcg tccgcccacg cgtccgctag aaatttctgt ggaactccat    60
ttgactttct atctgtgaaa tccaaactgt ctctgaagaa ataagaaaaa tagtgttttg   120
acttttagga gacaactatg tttattattt tgccttgcaa attaatgtct aaatttgtac   180
aagcacctat ctacagattt ttccaggtaa accatcatgt tttatgtgta aaggtagatt   240
gatgtgcatt tactttatac tttggtactt aggccattac acatctttgc actggaattg   300
gtgcagatat ataagtgatc ctaatgttga tgctgcccag accccaggaa tgcagaggtg   360
agcatgacac acacagtccc tgccctgatg gagctcatag actagtgaag gaatagggct   420
ctatgacc                                                            428




        <210> 73
        <211> 584
        <212> DNA
        <213> Homo sapiens




        <400> 73
gctggagtca ttgcctggtt tcaaagagat tgtgagcagg ggagtaaaag tggattactt    60
gactccagac ttccctagtc tctcgtatcc caattattat accctaatga ctggccgcca   120
ttgtgaagtc catcagatga tcgggaacta catgtgggac cccaccacca acaagtcctt   180
tgacattggc gtcaacaaag acagcctaat gcctctctgg tggaatggat cagaacctct   240
gtgggtcact ctgaccaagg ccaaaaggaa ggtctacatg tactactggc caggctgtga   300
ggttgagatt ctgggtgtca gacccaccta ctgcctagaa tataaaaatg tcccaacgga   360
tatcaatttt gccaatgcag tcagcgatgc tcttgactcc ttcaagagtg gccgggccga   420
cctggcagcc atataccatg agcgcattga cgtggaaggc caccactacg ggcctgcatc   480
tccgcagagg aaagatgccc tcaaggctgg tagacactgt cctgaagtac atgaccaagt   540
ggatccagga gcggggcctg caggaccgcc tgaacgtcat tatt                    584
```

```
<210> 74
<211> 348
<212> DNA
<213> Homo sapiens


<400> 74
ggcacgagat tttcatccaa aacaaacact ggacttcctg cggagtgaca tggctaattc      60
gaaaatcaca gaagaggtga aaaggagtat agcacaacag tatctagatt tgacagtagc     120
ccggaacaag tggaccctga tgccgaagtc gatgcagccc catctaccac atcttcatgt     180
ggacattgag attcacacgc tggctcctga aggggtgctca gtctccttgg tgattaaggt     240
cctgcttgaa ctggtgccaa ctccatggca gggaagttgc ttttggttgc ctggctgggt     300
ttcccagatc ccttctgggg caaggagcta tcagaccctg ctttcaag                  348



<210> 75
<211> 365
<212> DNA
<213> Homo sapiens


<400> 75
caagcaaagt ggggatgtca cctgcaactg cactgatggg cgcttggccc ccagctgcct      60
gacctgcgtc ggccactgca tttttggcgg ctactgtacc atgaacagca aaatgatgcc     120
tgaatgccag agcccacccc acatgacagg gccccggtgt gaggagcacg tcttcagcca     180
gcatcagcca ggacatataa cctccatcct aatccctatg ctgtagctgc tgctgctggt     240
tctggtggcc ggagtgatat tctgccataa acggcgagtc caaggggcta agggcttcca     300
gcaccaacgg atgaccaacg gggccatgaa cgcgcagatt gcaaaccccca cctacaagat     360
gtacc                                                                  365



<210> 76
<211> 700
<212> DNA
<213> Homo sapiens


<400> 76
caagaaccat cagcaccaac acaaatgtat ctttgcagac cgaaggaatc agctaaacaa      60
tttacagtca tctcaatctc tactaaaaca aaaatcacat ccaacatgcc acctgacacc     120
atttcttttct ctctctctct tttgctcctt gcgatgaggc attcatctct ccttgagcct     180
ccgttctgaa gagataacag tatagcaaca actctgccac tgaaatcctg ttctctgacc     240
gatattggca cctgcaaaga gaaacaacca gtaacaggca gcagcagcat cagtattaat     300
cttccatgat gaaatcttta caggtcaaga acaagtacac agctctttc tcactccttc     360
```

34

```
acagtggacc atgcaactag ttgaggtgga agacaatgga ttgtctacaa gcctttttgaa   420
cagtggagaa tgcagggcgt tggctttagg aagaggcaga aatccaggca gaacttgaac   480
gtttggaaag agtcagaaat cttcacatac gtgagctgaa aagaataaac aatgaagata   540
attcacagtt caaagatcac ccaacattaa atgaaagata tttattactt catctgcttg   600
gtagaggtgg ctttagtgaa gtgtataagg taatgtatgg tttattctgg ttttttaca   660
ctaatgtagc aaggatatag gagtatgtgg ttaagaagtg                         .   700
```

<210> 77
<211> 426
<212> DNA
<213> Homo sapiens

<400> 77
```
ttgcctagca catggcaggg tgcagcgcct gtctgaatgt gtgaagagtt cttagtgatg    60
ggtaaagggt gttcctgtgt gttttagatt ctgctcagca atcctcagat gtggtggtta   120
aatgattcca atcctgaaac cgacaaccgt caagaaagtc cttcccagga aaacattgac   180
cgagtgagtg acaggccttt gtgccctcag cttggacagc ctcgggtggg gttgcttggg   240
gtaacctggg tgaatcaggc agcaggactg ggggagtccg tgctgaaacc ttggctccca   300
ggctccaggt gtaacctgcc cacctcagag gccacccacg cagtaacaga gggcaggga   360
ggcctccttg gaaagcagga aaactgggga agtgtcagga agttctcttt aggtttgctg   420
cctttg                                                              426
```

<210> 78
<211> 358
<212> DNA
<213> Homo sapiens

<400> 78
```
tttcgtgcta tgttcttggc tgttcaacac gactgcagac ccatggacaa gagcgcaggc    60
agtggccaca agagcgagga gaagcgagaa aagatgaaac ggaccctttt aaaagattgg   120
aagaccgtt tgagctactt cttacaaaat tcctctactc ctgggaagcc caaaaccggc   180
aaaaaaagca aacagcaagc tttcatcaag taagttgaga atcctgagct tgcaaatatc   240
aatagttagc tgctgaactg aaaagggaa ctctgatgag cgtaagctaa catacagaac   300
ctctcttgca ggccttctcc tgaggaagca cagctgtggt cagaagcatt tgacgagg    358
```

<210> 79
<211> 322
<212> DNA
<213> Homo sapiens

```
      <400> 79
gggtttttca atttttccag cccaaagtta aaaggttgga aaatcaattc ctctttggtc      60
ctagagataa ggaagaacat acttcgtttc ttagatgcag aacgagatgt gtcagtggtc     120
aagagcagtt ttccaagcaa agacgccaga cactccagtg tgcaccggta gttcacccaa     180
ctgcattggg gaccgccctc tcatactcca gccaggccgt gacgtgaccg acctccgact     240
tctgcgcaaa ggcagcgcaa gccgttggga tcccctgctc cccctcgctc aacagtcggg     300
ccattacacc tttcatactg cg                                              322
```

```
      <210> 80
      <211> 310
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 80
cgaaagcacg ccagaaaaca aaataaaagc aatacataac cacaaaaata atagcgtata      60
gatgatcaac aagaattaaa acgcgtaaca tagtatagtc aaaaagaata cacgaaaaag     120
aaactccata aaaaatgcaa tatcatacag gcagatatca agccagacaa tatcctggat     180
aatgaatcca taactattct aaagcttagc gattttgggt cggcttcaca tgttgcggat     240
aatgacataa caccttcatc ttctcagacc acatccgctg catcatcgcc cccgcggacg     300
ctacgccgcg                                                            310
```

```
      <210> 81
      <211> 134
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 81
tcgagtaaac catgggacta aagcttggct ccaaagcatt caggctgaac gaaaaacatg      60
gactgctatt gcataatacc aacgtgcatt ggacgagaac gatgctatgg aacctgcata     120
ggcgacacgg tcgg                                                       134
```

```
      <210> 82
      <211> 358
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 82
ctctgggaga gaaagactaa tgggcaggat cccattactt cattggtaaa gatagtcgga      60
tactctcacc acttttaata cctttagtat tacagttgat cagattacct ttacttgata     120
tgaattattt ctaagttcat tcccctgtgt tgtagcttat ttcaacaatt ccaactagcc     180
```

36

```
gtttaaaatt cctcaaagaa actggtcatg gaacaccaat ggaagaaata cctgaggagg    240
aattatcaga ggatgttgaa cagattgatc acgctgatag ggagttgcgg cgtggccaaa    300
acttgaggtg caaaggaatt catagattgc ctactcatat acaagtaggg caaaatcg      358
```

```
        <210> 83
        <211> 723
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 83
tacacacaca cacacacaca cacacacact cactctctca gaggagagaa aatattaaga     60
atcgtgtatt ttacacaggt atccaaacat aaaaatactt tagaattgct tactgtatgg    120
acaggttata tggaatggag tttgtagtat ccacattaac aaagcaagtt tatatggact    180
ggttatgata ttagggatat gaattagaaa tggatgttgt tgcactcatt taaaatattt    240
tgcctctcac tttatcccca gttatagtgt ccttttgaat ttttctcaca cagtgctact    300
atatttcatg aactggtata taaacaaacc aaaattattt cttcaaatca agaacttatc    360
tacgaagggc gacgcttagt cttagaacct ggaaggctgg cacaacattt ccctaaaact    420
actgaggaaa accctatatt tgtagtaagc cgggaacctc tgaataccat aggattaata    480
tatgaaaaaa tttccctccc taaagtacat ccacgttatg atttagacgg ggatgctagc    540
atggctaagg caataacagg ggttgtgtgt tatgcctgca gaattgccag taccttactg    600
ctttatcagg aattaatgcg aaaggggata cgatggctga ttgaattaat taaagatgat    660
tacaatgaaa ctgttcacaa aaagacagaa gttgtgatca cattgggatt tctggtatcc    720
aga                                                                   723
```

```
        <210> 84
        <211> 407
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 84
ggcacgagga aaatgggacc caccgtctct cccatctgcc taccaggcac ctggggcgac     60
tacaacctca tggatgggga cctgggactg atctcaggct ggggccgaac agagaagaga    120
gatcgtgctg atcgcctcaa ggcggggagg tcacccgcag ctgggtaaag aaaatgggaa    180
cccgggagag gggaccctac gtgggaagaa tcagaggaag atgtacataa gagtaagtgg    240
acaagatgtg tggatgagaa gggcgcgtag tgctaaacag acaataagag accgctcagg    300
tgtggggtga cctaatgggg agacgtggaa tatgtttggt ggcacggagg aaagtctaat    360
ggatatcgtg tttaggagga cgatggagtc ttacgtgctc gttgatg                  407
```

```
        <210> 85
        <211> 342
        <212> DNA
        <213> Homo sapiens
```

```
<400> 85
ggcacgagct cgaaaattta atcaagagtg cgcactctta ttccctttac tgagggtaat        60
atctacacgg agcctagaca gccgaaccag aggcttcctt ttgtccaaga agaggatgga       120
atagacaagc tggagctgct ggctcccgga tgaatttcag acctggggtt ctcagctcca       180
ggcaacttgg actcccagga cctcctgacg gtcctgacta tactgtttac tacccgttcc       240
atcgacttgc catggtgact gctgcctcac gattggagcg tgaacacctt acgcatctat       300
gacactaggg atacaatgga gaggtataga gcaaccctag cg                         342
```

```
<210> 86
<211> 420
<212> DNA
<213> Homo sapiens
```

```
<400> 86
cgctccgcag gtttagcacc gactgtagct ctgatcagca ggaccgatta aacggaactg        60
cccctagcgg ttttaaccgc tcctgaccag tcccgttgcc gcaccccatc ttggaagtat       120
gccctggcca gtaggagcca caaagcgcga ttagcctcac tgcatttcag gtacaggccg       180
gcgccagccg tgcctcacca ggtccaccgg ctccgagcag cagcaagccc ggtcggaaag       240
cgaaagtggc ctcgccatgt ccagaccggc cagctccccc gcctacctga ccccgccccg       300
cagccgcacc tgggtccgag tcatcgccgc ggccgccacg gccccgcaca ggaaggcggc       360
agcaaagagc gcacgctcga cgcgctgcag ccaggacagc gccatggcgc ccctcgtgcc       420
```

```
<210> 87
<211> 392
<212> DNA
<213> Homo sapiens
```

```
<400> 87
ggcacgaggg gagaaggcgg ggctgggcct cagcttccca aaggtttttg aggaactggg        60
cttttctgac accctcaaag gtcagaaggt taaaggggca gaaggcattc ggaaagctcc       120
cctcccacag tgacacctct ctgacttctg acctagggtt ccaccaccgc ttcaatccca       180
atgcctccag ctccttcaag cccagtggga ccaagtttgc cattcagtat ggaactgggc       240
gggtagatgg aatcctgagt gaggacaagc tgactgtgag tggcctttga ctccaggaag       300
cctcgagcct gggagaaccc tgttgtctaa gatcatctgg cttagggagg ggcttgaggt       360
gcaggggctt cctgagccga tggatggggc tt                                    392
```

```
<210> 88
<211> 332
<212> DNA
<213> Homo sapiens
```

```
        <400> 88
gggaggaata taatgcatta cccaaatggt catgccatat gtattgcaaa tggacattgt     60
atcatcttgt gaaatagtca taacattaaa gtttgggtat agtagttagc atattttcat    120
ggccagtatt gatgctattt tttcccttac ctatcagact ctttcaaaga gaaaagaggg    180
agcagttgga attttatgtt tgttgttcta ttttgtctat tatgaattgt gacaaaacca    240
ttataaaaga tgacaagtgt gtgtgtttct tttttcttt ttaaactgta gggaacatag     300
tcattagtga tctcaaatac cgaaagacat tt                                  332
```

```
        <210> 89
        <211> 535
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 89
attaacctag gaaatacatg ttatatgaac agtgttattt aagccttgtt tatggccaca     60
gatttcagga gacaagtatt atctttaaat ctaaatgggt gcaattcatt aatgaaaaaa    120
ttacagcatc ttttttgcctt tctggcccat acacagaggg aagcatacgc acctcggata    180
ttctttgagg cttccagacc tccatggttt actcccagat cacagcaaga ctgttctgaa    240
tacctcagat ttctccttga caggctccat gaagaagaaa agatcttgaa agttcaggcc    300
tcacacaagc cttctgaaat tctggaatgc agtgaaactt ctttacagga agtagctagt    360
aaagcagcag tactaacaga gacccctcgt acaagtgacg gtgagaagac tttaatagaa    420
aaaatgtttg gaggaaaact acgaactcac atacgttgtt tgaactgcac gagtacctca    480
caaaaagtgg aagcctttac agatctttcg cttgcctttt ggccttcctc ttctg         535
```

```
        <210> 90
        <211> 432
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 90
gcccgggacg acccacgcgt acgactcagt ttaagtccaa actttctaat aatttgatgt     60
agcagcgtaa tgggctgcat tactagtgag ttccttatgt gagtgtgcga gcatatgctg    120
gatgacttat ctagaataat gtagaagaga attaaacatt gaatgggagc ttaaattagt    180
taatttctga ggttcccttc cattcttaga attctttgat ttttatattg aattgagaga    240
actagtatag tttttatttc agcaaattat aacaccattg ttctcaaggc atggaaaatg    300
tgctttttcat ctttaagata ctaaaccttt tcactcatgg caattttttt tagctagcct    360
ctaagcttgg aaagcagtgg accccattaa taatcctggc caactctctt agtggaacta    420
atatgggaga ag                                                        432
```

```
        <210> 91
```

39

```
<211> 780
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(780)
<223> n = a,t,c or g



    <400> 91
ccatgcatag gattaaactg aatgatcgaa tgacatttcc cgaggaacta gatatgagta      60
ctttattga tgttgaagat gagaaatctc ctcagactga aagttgcact gacagtggag       120
cagaaaatga aggtagttgt cacagtgatc agatgagcaa cgatttctcc aatgatgatg      180
gtgttgatga aggaatctgt cttgaaacca atagtggaac tgaaaagatc tcaaaatctg      240
gacttgaaaa gaattccttg atctatgaac ttttctctgt tatggttcat tctgggagcg      300
ctgctggtgg tcattattat gcatgtataa agtcattcag tgatgagcag tggtacagct      360
tcaatgatca acatgtcagc aggataacac aagaggacat taagaaaaca catggtggat       420
cttcaggaag cagaggatat tattctagtg ctttcgcaag ttccacaaat gcatatatgc      480
tgatctatag actgaaggat ccagccagaa atgcaaaatt tctagaagtg gatgaatacc      540
cagaacatat taaaaacttg gtgcagaaag agagagagtt ggaagaacaa gaaaagagac      600
aacgagaaat tgagcgcaat acatgcaaga taaaattatt ctgtttgcat cctacaaaac      660
aagtaatgat ggaaaantaa attgaggttc ataaggataa gacattaaag gaagcagtag      720
aaatggctta taagatgatg gatttagaag aggtaatacc cctggattgc tgtcgccttg      780



    <210> 92
    <211> 867
    <212> DNA
    <213> Homo sapiens



    <400> 92
ctcagtcatg ccagtgcctg ctctgtgcct gctctgggcc ctggcaatgg tgacccggcc      6Q
tgcctcagcg gcccccatgg gcggcccaga actggcacag catgaggagc tgaccctgct      120
cttccatggg accctgcagc tgggccaggc cctcaacggt gtgtacagga ccacggaggg     180
acggctgaca aaggccagga acagcctggg tctctatggc cgcacaatag aactcctggg     240
gcaggaggtc agccgggggcc gggatgcagc ccaggaactt cgggcaagcc tgttggagac    300
tcagatggag gaggatattc tgcagctgca ggcagaggcc acagctgagg tgctgggggga    360
ggtggcccag gcacagaagg tgctacggga cagcgtgcag cggctagaag tccagctgag     420
gagcgcctgg ctgggccctg cctaccgaga atttgaggtc ttaaaggctc acgctgacaa     480
gcagagccac atcctatggg ccctcacagg ccacgtgcag cggcagaggc gggagatggt     540
ggcacagcag catcggctgc gacagatcca ggagagactc cacacagcgg cgctcccagc    600
ctgaatctgc ctggatggaa ctgaggacca atcatgctgc aaggaacact tccacgcccc     660
gtgaggcccc tgtgcaggga ggagctgcct gttcactggg atcagccagg cgcgcgggcc    720
ccacttttga gcacagagca gagacagacg caggcgggga caaaggcaga ggatgtagcc    780
ccattgggga ggggtggagg aaggacatgt acccttttcat gcccacacac ccctcattaa    840
agcagagtca aggcatctca aaaaaaa                                         867



    <210> 93
    <211> 690
```

```
                <212> DNA
                <213> Homo sapiens




            <400> 93
tcggaaccgc cctgaattac ctctgtcgac ccacgcgtcc ggggaaacgc ttctacagga    60
tatggaaaaa tttggctcga tgatgtttcc tgtgatggag atgagtcaga tctctggtca   120
tgcaggaaca gtgggtgggg aaataatgac tgcagtcaca gtgaagatgt tggagtgatc   180
tgttctgatg catcggatat ggagctgagg cttgtgggtg gaagcagcag gtgtgctgga   240
aaagttgagg tgaatgtcca gggtgccgtg ggaattctgt gtgctaatgg ctggggaatg   300
aacattgctg aagttgtttg caggcaactt gaatgtgggt ctgcaatcag ggtctccaga   360
gagcctcatt tcacagaaag aacattacac atcttaatgt ccaattctgg ctgcgctgga   420
ggggaagcct ctctctggga ttgtatacga tgggagtgga aacagactgc gtgtcattta   480
aatatggaag caagtttgat ctgctcagcc cacaggcagc ccaggctggt tggagctgat   540
atgccctgct ctggacgtgt tgaagtgaaa catgcacaca catggcgctc tgtctgtgat   600
tctgatttct ctcttcatgc tgccaatgtg ctgtgcagag aattaaactg tggagatgcc   660
atatctcttt ctgtgggaga tcactttggg                                    690




            <210> 94
            <211> 948
            <212> DNA
            <213> Homo sapiens




            <400> 94
cgagtggcga ggttcatcat ggaggcagac ggagtctcgc tctgttggcc aggctggagt    60
gcaggggcgt gatctcggct cactgcaacc tccgtctccc ggactaaagc aattatcctt   120
cctcacgctt ccgagtagct ggaattacag gtgtcaagct agggatgcgt tccattccca   180
ttgccactgc ttgcaccatt taccataagt tcttttgcga gaccaacctg gacgcctatg   240
acccttacct gattgccatg tcttcaattt acttggccgg caaagtggaa gagcagcacc   300
tgcggactcg tgacatcatc aatgtgtcca acaggtactt taacccaagc ggtgagcccc   360
tggaattgga ctcccgcttc tgggaactcc gggacagcat cgtgcagtgt gagcttctca   420
tgctgagagt tctgcgcttc caggtctcct tccagcatcc acacaagtac ctgctccact   480
acctggtttc cctccagaac tggctgaacc gccacagctg gcagcggacc cctgttgccg   540
tcaccgcctg ggccctgctg cgggacagct accatggggc gctgtgcctc cgcttccagg   600
cccagcacat cgccgtggcg gtgctctacc tggccctgca ggtctacgga gttgaggtgc   660
ccgccgaggt cgaggctgag aagccgttgg gtggcagatt tatgccatgg acacagagat   720
cccctaaggt cctggcccag gcctgcccaa agagaagcca catctgcgtt tgtcctttga   780
gaggactttg actacaatac aggcatgaca tcaatgaaag gaaagtcatg aaatcgatga   840
gactgaatcc ctacggattt cttaaaagcc agatttgtag ggagaatgaa tgtgcaacgt   900
ggctgaaatc tattttgtgt aataaaaggt gatacaagtc aaaaaaaa                 948




            <210> 95
            <211> 541
            <212> DNA
            <213> Homo sapiens
```

41

<400> 95

```
ttagtttata aagaaaagac atttaattgg ctcatagttc tgcaggctgt acaggaagca    60
tagtagcttc tgcttctggg gaggcctcag gaaacttaca atcacagcag aaggtgaagg   120
ggaagcaggc acgccgtaca tggctgggct ttcggcctcc tcttcatcaa caaggagtcg   180
gtggtcatgg cctatctctt caccaccttc aacgccttcc aggggtcttt catcttcgtc   240
tttcactgcg ccttacagaa gaaggtgagg tcgagcgggg tcctgggtc acagcctccc    300
ttggagacgt ttcctgggta cccaggagaa ggcggcgagg gtggagggga ctcaggggct    360
ccctcaagcc cccagtgagt gctgcagggc ttctgtggtc aggtctgcgt cccccgggag    420
gggagcacga gctcagggtt agggagggtt taaccacggg tgaagagggt tctgttgaca    480
gacgctgagg ccgcaaacgc tcctcctctc tcttcacact cgccaacacc gcggtggcgc    540
t                                                                  541
```

<210> 96
<211> 603
<212> DNA
<213> Homo sapiens

<400> 96

```
cagcccgtaa ggatgatcta cctccaaata tgagattcca tgaggagaag aggctggact    60
ttgaatggac actgaaggca gggtgagaaa aaggctagcc ctcgaagtga aataagggct   120
gggagggcca agaatgatga tagacggtga gggactgagg gatcagctga tgagttaagc   180
ctcaacacct gtcctagggc tttgcagatg gccctcaaac gtgtttacac cctcctgagc   240
tcctggaact gcctagaaga cttttgatcag atcttctggg gccagaagag tgccctggct   300
ggtcagtggt tccccgaggt ctccataatc ccttaatggc ccctctggat gactcatcac    360
actccacagt cccccgtaac tctttgcaag aagagacctt atcatatctg gtcaactcag    420
agaggccttg agaatgaaaa cgcagaagct gggttcaggg agggttatat acctgaaccc    480
ctggggtaga ttttggagaa gggatatgca ggctgtggta catatatcct cctttcaccg    540
cccaccaaag agaacgttcg ccagtgctgg caggatgatg agttgttcag cttccctcgt    600
gcc                                                                603
```

<210> 97
<211> 1385
<212> DNA
<213> Homo sapiens

<400> 97

```
tctttcagca aggtggggggc aagcagaatg cctcccagga tttcacacct gagccctgcc    60
ccaccctgct gagaaaacac tccgccacgt gaagagacag aggaggatgg caggagttac    120
ctcgggaaac aaacaggatc ttctctgccc tgctccagtc gagttggcct gacccgcttg    180
gatcagtgac catttgctgg cagacagggg agagcagctt ccagcctggg tcagaagggg    240
tgggcgagcc cctcggcccc tcaccctcca ggctgctgtg agagtgtcaa gtgtgtaagg    300
gcccaaactc aggttcagtg cagaaccagg tcagcaggta tgcccgcccg tacgttaagg    360
gggccctcta aacccccttgc ctggcctcac ctggccagct caccccttttt gggtgtaggg    420
gaaaagaatg cctgaccctg ggaaggctcc ctggtagaat acaccacact tttcaggttg    480
ttgcaacaca ggtcctgagt tgacctctgg ttcagccaag gaccaaagaa ggtgtgtaag    540
tgaagtggtt ctcagtcccc agacatgtgc cccctttgctg ctggctacca ctcttcccca    600
gagcagcagg ccccgagccc cttcaggccc agcactgccc cagactcgct ggcactcagt    660
```

```
tccctcatct gtaaaggtga aggtgatgc aggatatgcc tgacaggaac agtctgtgga     720
tggacatgat cagtgctaag gaaagcagca gagagagacg ctccggcgcc ccagccccac     780
tatcagtgtc cagcgtgctg gttccccaga gcacagctca gcatcacact gacactcacc     840
ctgccctgcc cctggccaga gggtactgcc gacggcactt tgcactctga tgacctcaaa     900
gcactttcat ggctgccctc tggcagggca gggcagggca gtgacactgt aggagcatag     960
caagccagga gatggggtga agggacacag tcttgagctg tccacatgca tgtgactcct    1020
caaacctctt ccagatttct ctaagaatag cacccccttc cccattgccc cagcttagcc    1080
tcttctccca ggggagctac tcaggactca cgtagcatta aatcagctgt gaatcgtcag    1140
ggggtgtctg ctagcctcaa cctcctgggg caggggacgc cgagactccg tgggagaagc    1200
tcattcccac atcttgccaa gacagccttt gtccagctgt ccacattgag tcagactgct    1260
cccggggaga gagccccggc ccccagcaca taaagaactg cagccttggt actgcagagt    1320
ctgggttgta gagaactctt tgtaagcaat aaagtttggg gtgatgacaa atgttaaaaa    1380
aaaaa                                                               1385
```

```
        <210> 98
        <211> 2191
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 98
        accaccaccc gtgcggggggg atatctgagc catttctctg tgggcttttg ttttttcaaag    60
        actgggcagg ttgttgttga ggtgtgtgtg ggctgccacg attttgtgga agtataatac   120
        tttgtcatta tgagatgtcg tctctcggtg cctcctttgt gcaaattaaa tttgatgact   180
        tgcagttttt tgaaaactgc ggtggaggaa gttttgggag tgtttatcga gccaaatgga   240
        tatcacagga caaggaggtg gctgtaaaga agctcctcaa aatagagaaa gaggcagaaa   300
        tactcagtgt cctcagtcac agaaacatca tccagtttta tggagtaatt cttgaacctc   360
        ccaactatgg cattgtcaca gaatatgctt ctctgggatc actctatgat tacattaaca   420
        gtaacagaag tgaggagatg gatatggatc acattatgac ctgggccact gatgtagcca   480
        aaggaatgca ttatttacat atggaggctc ctgtcaaggt gattcacaga gacctcaagt   540
        caagaaacgt tgttatagct gctgatggag tattgaagat ctgtgacttt ggtgcctctc   600
        ggttccataa ccatacaaca cacatgtcct tggttggaac tttcccatgg atggctccag   660
        aagttatcca gagtctccct gtgtcagaaa cttgtgacac atattcctat ggtgtggttc   720
        tctgggagat gctaacaagg gaggtcccct ttaaaggttt ggaaggatta caagtagctt   780
        ggcttgtagt ggaaaaaaac gagagattaa ccattccaag cagttgcccc agaagttttg   840
        ctgaactgtt acatcagtgt tgggaagctg atgccaagaa acggccatca ttcaagcaaa   900
        tcatttcaat cctggagtcc atgtcaaatg acacgagcct tcctgacaag tgtaactcat   960
        tcctacacaa caaggcggag tggaggtgcg aaattgaggc aactcttgag aggctaaaga  1020
        aactagagcg tgatctcagc tttaaggagc aggagcttaa agaacgagaa agacgtttaa  1080
        agatgtggga gcaaaagctg acagagcagt ccaacacccc gcttctcttg cctcttgctg  1140
        caagaatgtc tgaggagtct actttgaat ctaaaacaga ggagtcaaac agtgcagaga  1200
        tgtcatgtca gatcacagca acaagtaacg gggagggcca tggcatgaac ccaagtctgc  1260
        aggccatgat gctgatgggc tttgggggata tcttctcaat gaacaaagca ggagctgtga  1320
        tgcattctgg gatgcagata aacatgcaag ccaagcagaa ttcttccaaa accacatcta  1380
        agagaagggg gaagaaagtc aacatggctc tggggttcag tgattttgac ttgtcagaag  1440
        gtgacgatga tgatgatgat gacggtgagg aggagtataa tgacatggat aatagtgaat  1500
        gaaagcagaa agcaaagtaa taaaatcaca aatgtttgga aaacacaaaa gtaacttgtt  1560
        tatctcagtc tgtacaaaaa cagtaaggag gcagaaagcc aagcactgca ttttttaggcc  1620
        aatcacattt acatgaccgt aatttcttat caattctact tttatttttg cttacagaaa  1680
        aacgggggga gaattaagcc aaagaagtat atttatgaat cagcaaatgt ggtgcctgat  1740
        tatagaaatt tgtgatccta tatacaatat aggacttta aagttgtgac attctggctt  1800
        tttcttttaa tgaatacttt ttagtttgta tttgacttta tttcctttat tcaaatcatt  1860
        tttaaaaact tacatttga acaaacactc ttaactccta attgttcttt gacacgtagt  1920
        aattctgtga catacttttt tttttcttata gcaatacact gtaatatcag aaatggttgg  1980
        cctgagcaac ctagtaagac ctcgtctcta ctaataatta aaaaactagc tggcatggta  2040
        gcacacacct gtagtcccag atacttggga ggccaaggca ggaggattgc ttgagaccta  2100
        gcaatcagtc agggctgcag tgagccatga tggcaccact gcactctagc ctgggcaaga  2160
```

43

gaacaagatc ctgtctcaaa aaacagggaa a   2191

<210> 99
<211> 335
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(335)
<223> n = a,t,c or g

<400> 99
ggcacgaggc tgaacttcag gtggatgatg agacaaaata gaccgatagg aatcgtctgg   60
ctatatactc cttgttgcca ctgctgagtg actagactgg cccagagatc cgcggtgcac   120
atgctggccg ctcctccctc agaaaaaggc aatggcctaa atactgttta aatgacctga   180
ctcgatgctg tgggaaactg gctgctctgc tgcatgccgt gtgactgtca gtccaaccgt   240
tacatttgcc acgttctcca cacggggggat agacgcaatg cgcccaggtc ccagttttct   300
ttggaggcag cagctctcgc agggctgaat gttgn   335

<210> 100
<211> 348
<212> DNA
<213> Homo sapiens

<400> 100
cctactctgg gggatcaacc agatcttcat tccataactc gtgcttctcg tcctaaatta   60
tgtactagaa aaaattgtaa tcctcttact ataactgtcc atgaccctaa ttcaactcag   120
tagtattatg gcatgtcatg ggaattaaga ttttatatcc caggatttga tgttgggact   180
atgttcacca tccaaaaaat cctggtctca tggagcccac ccaagccaat cgggccttta   240
actgatctag gtgaccctat gttccagaaa cccctaaca aagttgattt aactgttcct   300
ccaccattct tagtcataaa agatacactc caaagttcg agaaaatc   348

<210> 101
<211> 416
<212> DNA
<213> Homo sapiens

<400> 101
agcctcaata atgtaacact gccccaagcg aaaacagaaa aagatttcat ccaactctgc   60

44

```
accccctgggg taattaagca agagaaactg ggcacagttt actgtcaggc aagctctcct        120
ggagcaaata tgattggtaa taaaatgtct gccatttctg ttcacggtgt gagtacctct        180
ggaggacaga tgtaccacta tgacatgaat acagcatccc tttctcaaca gtaggatcag        240
aagcctattt ttaatgtcat cccaccaatt cccgttggtt ctgaaaattg gaataggtgt        300
caaggatctg gagatgacaa cttgacttcc ttggggactc tgaatttccc tggtcgaacg        360
gtttcttttt cttttgagat ggagtctcgc tctgtcgccc aggctggagt gcagtg          416
```

```
        <210> 102
        <211> 352
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 102
acgcgtccga caaaaacaac aacagatggg gaaactgaaa gtgcatagca caaaatgcgg         60
actaattctg aaatcaccaa tatgtatctg tgcttgggaa atagaggcat acacaggaat        120
gcagatgccc acacactcac attcacactc acactcactc tcacactcac tctcacactc        180
actctcactc gcactctcac actacaccga gatgctcaca cactcagcct ccccatgccc        240
aggcccctgc tctttgttaa tcataagaag accgtggaca acccacctgg aaactatgtg        300
cccacagacc cagactgaag gtgataaaag agggtggctg gcttgggggc tg               352
```

```
        <210> 103
        <211> 702
        <212> DNA
        <213> Homo sapiens
```
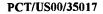
```
        <400> 103
aaagcaggtg cctggaaaag cctgctgagg gtgaagggga accatccagt gtcctgggtt         60
ggggaagcat tttcctcttt atgagtctgt ctctggtcct catggaacaa aagtgggcag        120
tggtggtatg agaagcagag gctaattgtc tacccctgc ctccaagtag aattactcct        180
tgtctgtgta cctggtgagg cagttgactg caggaaccct tctacaaaaa ctcagagcaa        240
agggtatccg gaacccagac cactcgcggg cactgagtga gtaacatctt tcctctcttc        300
cccacctgat ctggattcaa gtcttcctgg ccctccagcc ttcataatta aacccatacc        360
tcttttttga caacttactc cccttctcac atgaacccca accctccccc tctacccctg        420
accagtcttc cagtctttat agttgaagtt ggaccactcc caggcaccct tgaatttcca        480
atcatgtatc tgctttgcac ctcacagtcc ctaactccag ccctgctaga atatgggctc        540
tccggactgg aaagaatctt aggggtcctc taatctaacc ctcacatgat gcttcaactc        600
ctccagatca tctctaacat agccagagtg tcacgctatg tttaagcatc ttcagggatg        660
ggaaaatccc ccacacccat gtattgcggc cgctctagag ga                         702
```

```
        <210> 104
        <211> 689
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 104
gcaacatac attgtggact ttggcttcag tacaacattc agagaggggc agatgctgac        60
agcttttttgt ggcatgtacc cctacgtggc cccagaacgc tccctgggcc aggcatgcca       120
gtgacccgcc agggacatac aaagcctcag tgtcatactg tatttcagga atacagtagg       180
tagaagggcc aggactttgc ccttttactc agggaagcct ccaaacttca agaaaaaatt       240
ctcacaggaa gatatcatgc cccaccactt cttgcccttc aacttgactc attaaaaaat       300
tactaatgct gaacgccagg aagtgtcctt cactgtaact gatgaaaaat ccatgggtga       360
aaagtagcca gaagatgcca ctgataccat acgaagagcc actcctggac cacccaaac        420
aatccagctc atggtggcca tgggatttca ggccaagaac atctctgtgg caatcataga       480
aagaaaattc aactatccca tggccaccta cctcatttta gagcacacaa aacaagagag       540
gaagtgctcc accatcagag aactgtccct tcctcccggg gttcccacct ctccttcccc       600
atccactgaa ctttccacct tccctctctc actgatgcgg gctcataggg agccagcttt       660
taacgttcag cctcccgaag aaagccagg                                         689
```

```
        <210> 105
        <211> 776
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 105
agcaaagcag gagctggcca agctgatgcg gattgaggac ccctccctcc tgaacagcag        60
agtcttgctg caccacgcca aagctggcac catcattgcc cgccagggag accaggacgt       120
gagcctgcac ttcgtgctct ggggctgcct gcacgtgtac cagcgcatga tcgacaaggc       180
ggaggacgtg tgcctgttcg tagcgcagcc cggggaactg gtggggcagc tggcggtgct       240
cactggcgaa cctctcatct tcacactgcg agcccaacgc gactgcacct tcctgcggat       300
ctccaagtcc gacttctatg agatcatgcg cgcacagccc agtgtggtgc tgagtgcggc       360
gcacacggtg gcagccagga tgtcgccctt cgtgcgccag atggacttcg ccatcgactg       420
gactgcagtg gaggcgggac gcgcgctgta caggtgcagc tcccaccgcg ctgctcaggc       480
ccggcctagg ggtggggacc tgggggtggt cagaccttgc tgacctccac gcccactcag       540
gcagggcgac cgctccgact gcacttacat cgtgctcaat gggcggctgc gtagcgtgat       600
ccagcgaggc agtggcaaga aggagctggt gggcgagtac ggccgcggcg acctcatcgg       660
cgtggtgagc gcgacccca cccactgacc tctggccttt tccaggccag tccctcggca       720
actcacacgc atcatcccgg gtaatccagg gagtggtgaa gttttttcccg gggctc         776
```

```
        <210> 106
        <211> 707
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 106
cccacgcgtc cggatggacc ccaggaacca cccagacctt aggacagggg acagcatggg        60
acacagttgc ttccactcca ggaaccagcg agactacagc ttcagctgag ggaagacgaa       120
ccccaggagc aaccaggcca gcagctccag ggacaggcag ctgggcagag ggttctgtca       180
aagcacctgc tccgattcca gagagtccac cttcaaagag cagaagcatg tccaatacaa       240
```

46

```
cagaaggtgt ttgggagggc accagaagct cggtgacaaa cagggctaga gccagcaagg    300
acaggaggga gatgacaact accaaggctg ataggccaag ggaggacata gaggggggtca   360
ggatagctct tgatgcagcc aaaaaggtcc taggaaccat tgggccacca gctctggtct    420
cagaaacttt ggcctgggaa atcctcccac aagcaacgcc agtttctaag caacaatctc    480
agggttccat tggagaaaca actccagctg caggcatgtg gaccttggga actccagctg    540
cagatgtgtg gatcttggga actccagctg cagatgtgtg gaccagcatg gaggcagcat    600
ctgggggaagg aagcgctgca ggggacctag atgctgccac tggagacaga ggtccccaag    660
caacactgag ccagaccccg gcagtatgac cctggggacc ccctggg                  707
```

```
        <210> 107
        <211> 485
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(485)
        <223> n = a,t,c or g
```

```
        <400> 107
ccgctggaac atcaggtact ggggacactg gccctggtaa cacagcagtc tcaggcacac    60
ctgtggtatc acctggagca actcctggag ctccaggtag cagcacccct ggggaagcag    120
acattggaaa caccagtttt ggaaaatcag ggaccccaac agtatctgct gcctcaacta    180
ccagtagccc tgtgagtaaa cacaccgatg cagcctcagc cacagcagtg acaatctctg    240
gaagcaaacc aggtacacct ggaacaccag gtggtgcaac tagtggaggc aaaattacac    300
ctggaattgc atgacccacc ctggaccaaa agagcccctg cttctccggg tatggaggtt    360
atttccctgt aaatcctcac cagaacccat gtgctgattc cctgtaatct tcccacaata    420
aatttttagc agctctgnnn nnnnnnnnnn ngggggcgccc gttttaaggg acccacctttt   480
actcg                                                                485
```

```
        <210> 108
        <211> 565
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 108
cgggctcacc gctgctgtct cccgctccca agtctttctt gtgaaatcca aattggattc    60
tcttgatctt ccatctttcc agggcagtga gcttgtcctt gttcctgctg cagaagttgt    120
agaaggaact ggcctcagag cccacgctgt cctcatcatc ctcccgcacc ctgctccctg    180
cttctgagct cctgtctgcc gcctcctctc tcttgctctt ggcgtggtac ctccgggaag    240
cctccttctc aatctccagc agcctctcgt tccatgcgtc ccaggtgctc tccgaggaca    300
tcgagtctgc gcggcgcctc ctgccgtggt ccgggcggtt cagctccagc tgctgcttca    360
ggacccagat gtcgtggctg ctcacgctct cccaggcgct gctctcgctc agggtgcgcc    420
gccgcctccc caccgaggag ccagcgtcgc tctcctcctc tttctcctcc tcccttcccc    480
acctccggta cccttctgct aaaaacctct cgtttcggct ctgccactcg tgaatgatcc    540
tctccacgtc ctcgtcctcg acccg                                          565
```

```
       <210> 109
       <211> 986
       <212> DNA
       <213> Homo sapiens




       <400> 109
ggatgacgtg ccgcccccgg ctcctgacct ctacgacgtg ccccctggct tgcggcggcc        60
tggcccgggc accctgtacg atgtgccccg tgaacgggtg cttcctcctg aggtggctga       120
tggtggcgtg gtcgacagtg gtgtgtatgc ggtgcctccc ccagctgaac gtgaagcccc       180
ggcagagggc aagcgcctgt cggcctccag caccggcagc acacgcagca gccagtctgc       240
gtcctccttg gaggtggcag ggccgggccg ggaacccctg gagctggaag ttgctgtgga       300
ggccctggca cggctgcagc agggtgtgag cgccaccgtt gcccaccttc tggacctggc       360
aggcagcgcc ggtgcgactg ggagctggcg tagcccctct gagccacagg agccgctggt       420
gcaggacctg caggctgctg tggccgccgt ccagagtgcc gtccacgagc tgttggagtt       480
tgcccgcagc gcggtgggca atgctgccca cacatctgac cgtgccctgc atgccaagct       540
tagccggcag ctgcagaaga tggaggacgt gcaccagacg ctggtggcac atggtcaggc       600
cctcgacgct ggccggggag gctctggagc caccccttgag gacctggacc ggctggtggc       660
ctgctcgcgg gctgtgcccg aggacgccaa gcagctggcc tccttcctgc acggcaatgc       720
ctcactgctc ttcagacgga ccaaggccac tgccccgggg cctgaggggg gtggcaccct       780
gcaccccaac cccactgaca agaccagcag catccagtca cgaccccctgc cctcacccc        840
taagttcacc tcccaggact cgccagatgg gcagtacgag aacagcgagg ggggctggat       900
ggaggactat gactacgtcc accttacagg gggaaggagg agtttttaga agacccagaa       960
ggagcttctg ggaaaaaggg cagcat                                            986




       <210> 110
       <211> 414
       <212> DNA
       <213> Homo sapiens




       <400> 110
cgaagggaaa gcagcaggtt ggggcttctt gtggccaact tcagagcctg tcaccaggaa        60
aggtaagcat gggaggaagg aagatggcga cagatgaaga aaatgtctat ggtttagaag       120
agaacgctca gtcccggcag gagtccacgc ggaggctcat ccttgttggg agaacagggg       180
ccgggaagag cgccactggg aacagcatcc tgggccagag acggttcttc tccaggctgg       240
gggccacgtc tgtgaccagg gcctgcacca cgggcagccg caggtgggac aagtgccacg       300
tggaagtcgt ggacactccg gacattttca gctcccaagt gtccaagaca gatcctggct       360
gtgaggagag aggtcactgc tacctgctct cggcccccgg accccacgcg ctgg             414




       <210> 111
       <211> 419
       <212> DNA
       <213> Homo sapiens

       <220>
       <221> misc_feature
```

```
        <222> (1)...(419)
        <223> n = a,t,c or g




        <400> 111
gactctcggg ttacgttcac taacgaagga gggcggtggt gggggtgatg tggcggcctt          60
tgaggttggc acaggggctg cggccagccg ggcgctgggg cagtgcgggc agctccagaa         120
gctcatcgtc atcttcattg gcagcctgtg cgggctgtgc accaagtgcg ctgtgtccaa         180
cgacctcacc cagcaggaga tacagacccc ggagatacaa cagagaaatg cataatgtcc         240
agtcaattta ttaaagttcc aaagtnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn         300
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnatttcaa tatgattaaa gcaggagtga         360
ggacacagcg aaagtgagac aaggaaaaga gaacaaaata aaacaggaga gacagaata          419




        <210> 112
        <211> 1191
        <212> DNA
        <213> Homo sapiens




        <400> 112
gtgcaaggtg ctgtcactca cgtgtgccct cgaccctccc gttcacccgc agccttctca          60
gcgcctctcc ctgggccgga ggcctcctca ccagcctacc tgttgctctg gaaaaaaatc         120
ccgtcccccg actccgtccc taccccagt cttcggccgg ctctggcccc tggggagggg         180
gctgcacggt ggaaggaggc tggctatggg cccggctgcc cgctgcatgt acctcctcct         240
ccacccatcg cctcttgcct gggggtaact ttgcctgggg ctcattcttt ggttaagctg         300
aagctgccgt gggtggccaa accgcagatt ctttgcaaat tctgagctgg cagagctcgc         360
agccgggagc cggccgggga agaggagact tgcgcgccgc aagccgcctg cctccaccct         420
gctctccatc tcccgctcta gaagggctgg gaagctcgcg gccggggttc cacctggaag         480
ctgcttgcat ggctgaaccc agcttaggtc cctgacgggg ctgctggtgg aattctcccc         540
cttcgaagct ggggaggttt aggaggggga aggcttctgt gaagctctca aaccactaat         600
agagcccct ccccaacagt gacggcgcag atgctccccc ttttcttagt tgacaccacc         660
aggcagcttc ctggccgttg gtaggttcct gcagctggct gagggaacag ggaccggcag         720
gggactttgt tagggagggg ttgggatggg cagtgggccc ctgaaagtta atatattgga         780
acctagctcg agtgtcgttc tttccaattc cgaaagtaga aagagtaaaa ataggggtga         840
ttggggtggg gttagtagaa tgcctctctc agggcgctcc ccctccccc accgtttag          900
agagctaggc ctcagccagt cttgccactc ccatctcagt gcttcctgaa gaggctgttt         960
tgagtgttga tgaaaagcaa tgcaattatg ccaaacagta ttgagcagaa taatttattt        1020
cttttttttc ttttgcttta aatcatgaat cccgccaggt acggtggctc acgcctgtca        1080
tcccagcact tgggaggcc aaggcgggcg gattacttaa tacttaaggt caggagttcg         1140
agaccagcct ggccgatatg gtgaaacctc gtctctacca aaaaaaaaaa a               1191




        <210> 113
        <211> 1240
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(1240)
        <223> n = a,t,c or g
```

```
        <400> 113
        agaacacgaa ctagtgtctc taagccacta taatagttgc acatacaaca tgagtgtggt    60
        gtggtaggat gcttttcctt ttaggtcttt actgaacttt caagggatta aaaccaatgt   120
        atgtcaactt tatagcaaaa gattcagatt ctaatcctga ataccaatgc attttagagg   180
        gggaaaaaat gagggatgta aaatatatat agtagggtaa gagtttttgcc tttgaacaat   240
        gtgcatattc tattttaatt tggaatgttt tacttgca tttcatgtta tgtagttttt   300
        ggactggact gtgtttttcc acaaaatgaa aaatcaacta ttttgccacc ttattattca   360
        acctacctgc ccatagttgt ctatgccagt tactaatcta tttaaattta ataaatcaaa   420
        agctgtcctt agggattggc caagagtcgt aagtccttca gcctgaaggt ttttcaattc   480
        attcataaac gttgcatggt tttctttcca tccagccttg atagcatagg gcggctcttc   540
        gaaagtgacc agcatatacc tgtctcctct gctggcaggg tcccgggcac ggagcttcat   600
        gaaggtctct accgcgcctt tggccgtgtc caggtaggtg gtgcccagat ggctgcgctg   660
        gttcatagag gcagacgtgt ctatcaggaa cagtaagatg ggcatagtgc tggccgggga   720
        caccggggcc cgaggtggtg gagaaagagg agatggtaga ggtggaggcg ccggtggcgg   780
        cgaccgccgc tagcgggggcg ggggagcacg gccccgggga ggaaaacact gtctgggtct   840
        ttcctccggc tgcggggaat tcctcccccg atagttgaga ggaaactccc cagacccagt   900
        gctcccgtc gtaccnccgc ctccgcctcc tctgcctgc ctgccgctg gggcgggcgc   960
        ccagccgtct gtctgtcggt tcgtcccccc cgcctcgggg gtcccgtccc cgctcccggc  1020
        ccctgtgtgt gtcccagcgg gagacgggcc tggctcccca ccccacccccc ggtacaggag  1080
        tgggggacctg ggagctggcg aagaggggag tgggctgagg gaagattggc cctggggctg  1140
        ttgggagaag tttcagggac tccctccgca caccggcggt gtcaccactt tctcagcccc  1200
        tctcgcggac gcgtgggtcg cgccggggtt tccgcaggca                        1240


        <210> 114
        <211> 810
        <212> DNA
        <213> Homo sapiens



        <400> 114
        aatagaattc cgtcggcaca cgcacgcgta cctaggatcg tatagagcgg ccgcaataca    60
        tgccgtcttc ttaaatcaac tcctctctct caaaaagcct ttctttccgt gtcgcgaata   120
        tcatccctcc ggtcctgtcc cgcagcgagt tccccggcgt tgggcttctc tattatgccg   180
        gccagcggag tccaattggt ctgacttcac tgtccggaga atcctctcgc tcccaaacct   240
        ccctgagaga cgacctttaa ccgtgccagc cggacctgcc tacaaagacc ctcctcttca   300
        acctgtcccc tgtgttactc cacaaaacgg acacagaagt tcgtcaacct gcccagatac   360
        cacgcctcaa agcggcaaca gagccgaacc cctttctcag gcttcggacg gcccagaccc   420
        ggcatctctt ttctcctctt ccccagaccc ttccacctct ggcctccgag agccccagcc   480
        tcagttcccc tccaggccct aggaaccta ctctccagca gtacagtctg tagaccccg   540
        aatcagttcc ccactcaacc tcagaactcc tctggcgccg actggcccca ctcgggcaaa   600
        ggatggcggt ggataggatg acccgaacca ccagagccag caaacttacc ccagccgcca   660
        tggtgattcc gcaaagaaag ggggtggggt tctcggcgct gccgcaaagt aagcccgccc   720
        gggagagaag ggaggggaa agaggagagc cgtggagaaa cagcagccga aaaacgagga   780
        cgaaacagaa gacatacgta cgacagttcg                                   810


        <210> 115
        <211> 320
        <212> DNA
```

<213> Homo sapiens

<400> 115
caagagcacg atgctgaagc actggagagt ggggctctgg ggtcagtgct ggatcagagg   60
caagaggagg tgatgatgcg gccctgtcct gagtgacacc aacccctccc cagtactaca   120
cctgcagctg tgtcctgggc ttcattgcct gctccatctt cttgcagatg agcctgaagc   180
caaaggtcat gctgctgaca gtggccctgg tggcctgtct cgtgctcttc aacctctccc   240
agtgctggca gcgggactgc tgcagccaag gcctgggcaa cctcactgag cccagtggca   300
ccaacaggta gggccccgcc   320

<210> 116
<211> 456
<212> DNA
<213> Homo sapiens

<400> 116
ggcaaggcag gcggcgcggc cggcctcttc gccaagcagg tgcagaagaa gtttagcagg   60
gcccaggaga agtagacaag gcggtttggg aagacatgtc agccagaaga aagagcgagg   120
gaagaaagac aagaaggacc tgagatagag tttgggtttt ccttttttc tctctctctt   180
tattaagccc aacctgcctt ctacaacgga gaagtttgg ttttctaaga gctgatggac   240
ttagaagcat ttggatgaac agctctgctt accaactgaa atatccctat tatcttctaa   300
aagtggagca ctgctttgag ccctgggaag gcttaaaggc aaccagctct cccgagttga   360
tttatcagca gaaaactgat ggaatgtaga tgtagctcct gactttaaga gaccacaatg   420
gaagggaggt tattttctat catttgaggt catgtg   456

<210> 117
<211> 2398
<212> DNA
<213> Homo sapiens

<400> 117
cccacgcgtc cggtcagcct cagtcttcaa tgagggaccc cgtacagagt aacccaaacg   60
cttgttccta tttcaggatg tgaacactct gcaggaggt gggcagcctg tggtgactcc   120
gtccgtccag ccctctcttc agccggccca tccagcgtta ccacagatga cctcacaggc   180
acctcagcca tctgttactg ggctccaggc accttctgct gccttaatgc aagtgtcatc   240
tctcgattcc cactcagctg tatctggaaa tgcccaatcc tttcagccct atgcaggtat   300
gcaagcctac gcttatcccc aggcatctgc cgtcacctcc cagctgcagc ccgttcggcc   360
tttgtaccca gcaccgctct ctcagcctcc ccatttccaa ggatcaggtg atatggcttc   420
atttctcatg actgaagccc ggcaacataa cactgaaatt cgaatggcag tcagcaaagt   480
ggctgataaa atggatcatc tcatgactaa ggttgaagag ttacagaaac atagtgctgg   540
caattccatg cttattccta gcatgtcagt tacaatggaa acaagcatga ttatgagcaa   600
catccagcga atcattcagg aaaatgaaag attgaagcaa agatccttg aaaagagcaa   660
tcggatagaa gaacagaatg acaagattag tgaactaatt gaacgaaatc agaggtatgt   720
tgagcagagt aacctgatga tggagaagag gaacaactca cttcagacag ccacagaaaa   780

```
cacacaggca agagtattgc atgctgaaca agagaaggcc aaggtgacag aggagttagc     840
agcggccact gcacaggtct ctcatctgca gctgaaaatg actgctcacc aaaaaaagga     900
aacagagctg cagatgcagc tgacagaaag cctgaaggag acagatcttc tcaggggcca     960
gctcaccaaa gtgcaggcaa agctctcaga gctccaagaa acctctgagc aagcacagtc    1020
caaattcaaa agtgaaaagc agaaccggaa acaactggaa ctcaaggtga catccctgga    1080
ggaggaactg actgaccttc gagttgagaa ggagtccttg gaaaagaacc tctcagaaag    1140
gaaaaagaag tcagctcaag agcgttctca ggccgaggag gagatagatg aaattcgcaa    1200
gtcataccag gaggaattgg acaaacttcg cagctcttg aaaaagactc gagtgtccac    1260
agaccaagca gctgcagagc agctgtcttt agtacaggct gagctacaga cccagtggga    1320
agcaaaatgt gaacatttgt tggcctccgc caaggatgag cacctgcagc agtaccagga    1380
ggtgtgcgca cagagagatg cctaccagca gaagctggta caacttcagg aaaagtctgt    1440
ttgttttgca gtgtttagcc ctccaggccc aaatcacagc tctcaccaag caaaatgaac    1500
agcacatcaa ggaactagag aagaacaagt cccagatgtc tggggttgaa gctgctgcat    1560
ctgacccctc agagaaggtc aagaagatca tgaaccaggt gttccagtcc ttacggagag    1620
agtttgagct ggaggaatct tacaatggca ggaccattct gggaaccatc atgaatacga    1680
tcaagatggt gactcttcag ctgttaaacc aacaggagca agagaaggaa gagagcagca    1740
gtgaagaaga agaagaaaaa gcagaagagc ggccacgaag accttcccag gagcagtcag    1800
cctcagccag ttctgggcag cctcaagcac ccctgaatag ggagaggcca gagtccccca    1860
tggtgccctc agagcaggtg gtcgaggaag ctgtcccgtt gcctcctcag gccctcacca    1920
cttcccagga tggacacaga aggaaagggg actcagaagc tgaggcactc tcagagataa    1980
aagatggttc ccttccaccc gaactgtctt gcatcccatc ccacagagtt ctagggcccc    2040
cgacttcaat tccacctgag cccctaggcc ctgtatccat ggactctgag tgtgaggagt    2100
cacttgctgc cagcccaatg gcagctaaag cccgacaacc catcagggaa aggtctgtgt    2160
tcaggggaag taggcaccag atgggcccac ttacaaggaa aggttccaca agattgttcc    2220
ctggatttca ggaccccgag ggaggggggac ccactggcct tagggcttga aaagcccagg    2280
gagagcctca gcctccacag cttcaaggaa aggttgatgt tcactaggtt ccaccggttc    2340
cccacaaggg agcttttcaa gaacaggagg gcaggtttcc acagttttgc agggagca      2398
```

```
        <210> 118
        <211> 800
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 118
agcgaaacgg cgcagcaaat tatcgaccgt ctgcgcgtaa aactggcgaa agaaccgggg      60
gcgaatctgt tcctgatggc ggtacaggat attcgcgttg gtgggcgtca gtcgaacgcc     120
agctaccagt acacgttgtt atccgacgac ctggcggcac tgcgagaatg ggagccgaaa     180
atccgcaaaa aactggcgac gttgccggaa ctggcggacg tgaactccga tcagcaggat     240
aacggcgcgg agatgaatct ggtttacgac cgcgacacca tggcacggct gggaatcgac     300
gtacaagccg ccaacagtct gttaaataac gccttcggtc agcggcaaat ctcgaccatt     360
taccagccga tgaaccagta taaagtggtg atggaagtgg atccgcgcta tacccaggac     420
atcagtgcgc tggaaaaaat gttcgttatc aataacgaag caaagcgat cccgctgtca      480
tatttcgcta aatggcaacc ggcgaatgcc ccactatcgg tgaatcatca gggattatcg     540
gcggccttga ccatttcgtt taacctgccg accggaaaat cgctctcgga cgccagtgcg     600
gcgatcgatc gcgcaatgag ccagcttggt gtgccttcga cggtgcgcgg cagttttgcc     660
ggcccggcgc aggtgttcca ggagaccatg aactcgcagg tgatcctgat tattgccgcc     720
atcgccacgg tgtatatcgt gctgggaatc ccttacgaga ggtacgtaca tccgccgacg     780
attctcttgt gaaggccgcc                                               800
```

```
        <210> 119
        <211> 427
        <212> DNA
```

52

<213> Homo sapiens

<400> 119
aaatcatcac acctgatgcg atgggttgcc agaaagatat tgcagagaag atacaaaaac   60
agggaggtga ttatttattc gctgtaaaag gaaaccaggg gcggcttaat aaagcctttg   120
aggaaaaatt tccgctgaaa gaattaaata atccagagca tgacagttac gcaatcagtg   180
aaaagagtca cggcagagaa gaaatccgtc ttcatattgt ttgcgatgtc cctgatgaac   240
ttattgattt cacgtttgaa tggaaagggc tgaagaaatt atgcgtggca gtctcctttc   300
ggtccataat agcagaacaa aagaaagagc cagaaatgac ggtcagatac aatatcagtt   360
agttgggtat cgccggggat atatcagtca cagcgatctc cgggacggac gattgaatct   420
cgtaatc   427

<210> 120
<211> 378
<212> DNA
<213> Homo sapiens

<400> 120
ccattatttg aaaatgctca ctcaggcgcg gcgggaagtg attatcgcca acgcctactt   60
cttccccggc tatcgatttt tacacgcctt gcgtaaagcg gcacggcgcg gggtgcggat   120
caaactgatc attcagggcg aaccggatat gccgattgtc agagtcggtc cgcgcttgct   180
gtataactat ctggttaaag gcggcgttca ggttttttgag taccgccgcc gcccgctcca   240
cggcaaagtg gcattgatgg acgatcactg ggcgacagta gggtccagta atctccatcc   300
ggtcagttag tcggggaatc tccaagcaaa tgtcatcctc cacgttctac gggtaccgac   360
attgaatccg taatcatg   378

<210> 121
<211> 508
<212> DNA
<213> Homo sapiens

<400> 121
ctgccgcctg gtgaagttta cgccccatcg aagccctggc aaaagaagtc cgtgaactga   60
aataacatac tcgttaattg ctcaatccag ccacaacgcg agaactgacc agtctgggac   120
gaaacctgaa ccgattgtta aaaagtgaac gcgaacgtta cgacaaatac cgtacgacgc   180
tcaccgacct gacccatagt ctgaaaacgc cactggcggt gctgcaaagt acgctgcgtt   240
ctctgcgtag tgaaaagatg agcgtcagtg atgctgagcc ggtaatgctg gagcaaatca   300
gccgcatttc acagcaaatt ggctactacc tgcatcgtgc cagtatgcgc ggcgggacat   360
tgctcagccg cgagctgcat ccggtcgccc cactgctgga caatctcacc tcagcgctga   420
tcaaaggcaa gccgcgtaaa ggggcaacg tcactgtttt tccattcaca gcgatgtaca   480
gggacggaca ttgaatccgt gatcagtg   508

```
<210> 122
<211> 724
<212> DNA
<213> Homo sapiens


<400> 122
gggtaacact gtgatgtttc agcacctgat gcagaagcgg aagcacaccc agtggacgta    60
tggaccactg acctcgactc tctatgacct cacagagatc gactcctcag gggatgagca   120
gtccctgctg gaacttatca tcaccaccaa gaagcgggag gctcgccaga tcctggacca   180
gacgccggtg aaggagctgg tgagcctcaa gtggaagcgg tacgggcggc cgtacttctg   240
catgctgggt gccatatatc tgctgtacat catctgcttc accatgtgct gcatctaccg   300
ccccctcaag cccaggacca ataaccgcac gagcccccgg gacaacaccc tcttacagca   360
gaagctactt caggaagcct acatgacccc taaggacgat atccggctgg tcggggagct   420
ggtgactgtc attggggcta tcatcatcct gctggtagag gttccagaca tcttcagaat   480
gggggtcact cgcttctttg gacagaccat ccttgggggc ccattccatg tcctcatcat   540
cacctatgcc ttcatggtgc tggtgaccat ggtgatgcgg ctcatcagtg ccagcgggga   600
ggtggtaccc atgtcctttg cactcgtgct gggctggtgc aacgtcatgt acttcgcccg   660
aggattccag atgctaggcc ccttcaccat catgattcag aagatgattt ttggcgacct   720
gatg                                                               724


<210> 123
<211> 435
<212> DNA
<213> Homo sapiens


<400> 123
gagaaagcag cagctgccaa catagatgaa gtgcagaagt cagatgtatc ctctacaggg    60
cagggtgtca tcgacaagga tgcgctgggg cctatgatgc ttgaggtagc acatcttcat   120
tttagtgctg tattttaaaa tcttgttgat cttcacatta ttacatttaa tttcaggtga   180
atataattta aggagaatcc acactagtac tagtactatg gacctcttga gcttgctgat   240
atgcctgtgt gtctctatgt atgttttggc tcctgctgcc agtatatgtg tgtttgaaat   300
taacatagaa ttaaattaac tagattagag tagacattgg caagttgtaa ttgccagttg   360
agcatttatt tgaaaaactg tattcacaag tcctactaaa ttctgtgttg attttagctt   420
gaaatgttct caaaa                                                   435


<210> 124
<211> 363
<212> DNA
<213> Homo sapiens


<400> 124
actggaagtg ccttcagagg tcaccccttt gggctttgcc atgcaggcta caaagactct    60
```

54

```
cctcctcaga acatgctgct tgcaggaatt caacatcatg gaaaagaata aaggatgggc    120
tctcctggga ggaaaagatg gccatcttca gggactattt ctccttgcca acgcattgct    180
ggaaagaaat cagctccttg cacagaaggt catgtactta ttagtccctc ttcttaaccg    240
agggaatgat aaacataaac tcacatctgc aggctttttt gtggagcttc tccggagtcc    300
agtggccaag agactgccca gcatatactc tgttgcccgc tttaaagact ggctacaaga    360
tgg                                                                  363
```

```
        <210> 125
        <211> 373
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 125
agaccggccc ccgctccctc agctgcgccg gaggaggcgc ccagtcctcg gggtgaaggg    60
tcgggggatg gcgaagcgaa gagtgcccgc tccggtgtgg gggggagcag gaggagggac    120
gaagtccgcc cgccgcgccg ccgccgcgcc tgacaccgag cggagcgagg aaggaggacg    180
agcggtgaag gaagcctacc cttccagccg tcagccgccg ccgccgtcgc cgtgaccct     240
gcgttgcgcc cggcgctgcc acccgaactt agccccctcg atgccaattt caaataggga    300
aggaaaaggg aaaagaaggg aagagaaaat ccggccgctg agtcccgcgt ccactcacac    360
ctccgctcgt gcc                                                       373
```

```
        <210> 126
        <211> 362
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 126
gcctacaggg ggtccatggc agcagttcta ctttctgcag ctccctaagc agtgactttg    60
acccctaga gtactgcagc cctaaagggg atcccagcg agtggacatg cagcctagtg    120
tgacctctcg gcctcgttcc ttggactcgg aggtgcccac aggggaaacc caggtttcca    180
gccatgtcca ctaccaccgc caccggcacc accactacaa aaagcggttc cagaggcatg    240
gcaggaagcc tggcccagaa accggagtcc cccagtccag gcctcctatt cctcggacac    300
agccccagcc agagccacct tctcctgatc agcaagtcac cagatccaac tcagcagccc    360
ct                                                                   362
```

```
        <210> 127
        <211> 351
        <212> DNA
        <213> Homo sapiens
```

```
      <400> 127
catggctgac cccgacccc  ggtaccctcg ctcctcgatc gaggacgact tcaactatgg      60
cagcagcgag gcctccgaca ccgtgcacat tcgaatggcc tttctgagaa gagtctacag     120
cattctatct ctgcaggatc tcttagctac tgtgacttcg acagataatt tagcctttga     180
ggatggacgg actgactggc tgcaaaggcc tgactgtgtc tccttcaaaa ttcatgtgct     240
gccaatgtga cggtattaag aggaggggcc ttagaggggg attagatcct gaaaggtcct     300
tactttttgg agtgacgagg atgcatacga tgaaagcatc tcgtagatac g             351
```


```
      <210> 128
      <211> 374
      <212> DNA
      <213> Homo sapiens
```


```
      <400> 128
gaactcccca aaggcaccat ccaggttttt accccgcttg tcaaattccc ctctggccca      60
gggctggctg ctcagcagga gtgtttaata agcacttaat tgcccggtga gtacagacca     120
ttccagctca ccttaactgt ttcctggctg actcgcctct cggcctgatt gccctgctca     180
tctggctgag tgagctggaa tgagtgtagt ggtagtgcca cctataggtt cctcttacct     240
tggtcttatt tcacaggagc acttcccgaa cgagtttacc tcgggagatg gaaagaaagc     300
tcaccaggac tttggctact tttatggctc gagctatgtg gcagcctctg acagcagccg     360
gactcctggg ctgt                                                       374
```


```
      <210> 129
      <211> 392
      <212> DNA
      <213> Homo sapiens
```


```
      <400> 129
taccaccacg cccagcccca acatatgact ttctgtgtgt tttccaagag tctagtgtga      60
ggtcagaggt cagacaggtc atcaggaatt ttgcttcaag tgagttgctg ctgccctgac     120
tcttttcccc cagcaattaa gtccccccgg ggcttggggg ttgggtttgt cagcttgctt     180
ttgctgtgct gagggcttct ccagactgaa tcagcaggtc ctcagctcat ctctgctcct     240
tctctctagg accaactgcc cctgtaagta cagttttttg gataacctca agaagttgac     300
tcctcgacgc gatgttccca cttaccccaa ggtaagatga gattccggcc cagaagaagc     360
tgcagctgtg tccccagccc cacgccgagc cc                                   392
```


```
      <210> 130
      <211> 359
      <212> DNA
      <213> Homo sapiens
```

```
        <400> 130
ccgggacgat gcctgcctct actccccagc ctcagctccc gaggtcatca cagtaggggc      60
caccaatgcc caggaccagc cggtgaccct ggggactttg gggaccaact ttggccgctg     120
tgtggacctc tttgccccag gggaggacat cattggagcc tccagcgact gcagcacctg     180
ctttgtgtca cagagtggga catcacaggc tgctgcccac gtggctggca ttgcagccat     240
gatgctgtct gccgagccgg agctcaccct ggccgagttg aggcagagac tgatccactt     300
ctctgccaaa gatgtcatca atgaggcctg gttccctgag gaccagcggg tactgaccc      359
```

```
        <210> 131
        <211> 389
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 131
gttagaaatc aagttttttgg agcaggtgga tcaattctat gatgacaact ttcccatgga      60
aattcggcat ctgttggccc aatggattga aaatcaagac tggtaggatc aaacatattt     120
tccctagaag ttgatgcaca aatgtctgat gctctatcca tgtgaattta ttttatggtc     180
cactttttac tcagtagatg cattcttttc aggtaaagaa ctttctcaag gatttgaaag     240
ccttcccaaa gaaggggaat aattgtcctt tctggttcca ttcattgtaa atgaaaagtt     300
aatggttcca gtgcttcttt tctctgtaaa caaaaaccca ataattttt catgtattaa     360
aaaaagaagc aaatcaattg attgtcagt                                     389
```

```
        <210> 132
        <211> 465
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 132
ggaggcagga gatgcggatg aagatgaggc tgatgctaat agctctgact gtgaaccaga      60
ggggcccgtg gaagcggaag agcctcctca ggaggatagt agcagtcagt cagactctgt     120
ggaggaccgg agtgaggatg aggaagatga acattcagag gaggaagaaa caagtggaag     180
ttcagcatca gaggaatctg agtctgaaga gtctgaggat gcccaatcac agagccaagc     240
agatgaagag gaggaagatg atgattttgg ggtggagtac ttgcttgcca gggatgaaga     300
gcagagtgag gcagatgcag gcagtgggcc tcctactcca gggcccacta ctctaggtcc     360
aaagaaagaa attactgaca ttgctgcagc agctgaaagt ctccagccca agggttacac     420
gctggccacg acccaggtaa agacgcccat tcccctgctt ctgcg                   465
```

```
        <210> 133
        <211> 354
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 133
ctaaaaaacc taagggagtt actgcttgaa gacaaccagt tacccccaaat accctctggt      60
ttgccagagt ctttgacaga acttagtcta attcaaacca atatatacaa cataactaaa     120
gagggcattt caagacttat aaacttgaaa aatctctatt tggcctggaa ctgctatttt     180
aacaaagttt gcgagaaaac taacatagaa gatggagtat ttgaaacgct gacaaatttg     240
gagttgctat cactatcttt caattctctt tcacacgtgc cacccaaact gccaagctcc     300
ctacgcaaac tttttctgag caacacccag atcaaataca ttagtgaaga agat           354
```

```
        <210> 134
        <211> 326
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(326)
        <223> n = a,t,c or g
```

```
        <400> 134
cccacgcgtc cggngacagg cctggccggc ctctgcagag acgtccaacc tcgtgcgcat      60
gcgcagccag gccctgggcc agtcggcgcc ctcgctcacc gccagcctga aggagctgag     120
tctccccaga agaggaagtt tccctgtgtg tccaaatgct gggagaacat caccccttgg     180
atgaattgcc accacattaa ataaaatata tccaaagctc nnnnnnnnnn nnnngggggg     240
gccgttttaa aggaccccttg ggggggccaa ggtttacgcg ggctggcaag gtaatagttt     300
tttccttata gggagccgaa ttaaaa                                           326
```

```
        <210> 135
        <211> 210
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 135
cttctgtgtg tctgtcttcc tgtgggtgcc tgcccgtctc tttctcttct aacagcccct      60
ttgaaccagc tgatgcgctg tcttcggaaa taccaatccc ggactcccag tcccctccta     120
cattctgtcc ccagtgaaat agtgtttgat tttgagcctg cccagtgtt cagaggtagt     180
tgggctcttc tttcttggtc gacgcggccg                                       210
```

```
        <210> 136
        <211> 310
        <212> DNA
        <213> Homo sapiens
```

```
       <400> 136
ttttttccaat acacatataa accatcattc actaaaatgt actatatatt caatattttg      60
tgtatactca ctgcttttcc taacgtgaaa aatttaccaa aatgctaatt gtgacttata     120
aggtatttaa cagactcccg acaaaaagca gaatgatcag cgaaatcgga aaagaaaagc     180
tgaaccatat gaaactagcc aaggtagtaa taatttcgta tcaacaaaag tactcaattc     240
taatgtactt agatagaatt ttctaactca tactaaataa ttagtttgta cacagggatt     300
cctgataaag                                                            310




       <210> 137
       <211> 502
       <212> DNA
       <213> Homo sapiens




       <400> 137
cttaaagtga aatttaaaaa gtaataataa ttttttaaaaa tgtttaaagg cttactttgg      60
agagacagtt ttacatagct taatatttta tcattaaagg catggtggag ctggttcctg     120
cttccgatac cctcaggaaa atccaagtgg aatatggtgt gacaggatcc tttaaagata     180
aaccacttgc agagtggcta aggaaataca atccctctga agaagaatat gaaaaggctt     240
cagagaactt tatctattcc tgtgctggat gctgtgtagc cacctatgtt ttaggcatct     300
gtgatcgaca caatgacaat ataatgcttc gaagcacggg acacatgttt cacattgact     360
ttggaaagtt tttgggacat gcacagatgt ttggcagctt caaaagggat cgggctcctt     420
ttgtgctgac ctctgatatg gcatatgtca ttaatggggg tgaaaagccc accattcgtt     480
ttcagttgtt tgtggacctc tg                                              502




       <210> 138
       <211> 963
       <212> DNA
       <213> Homo sapiens




       <400> 138
ctcctagtcc cctccctagc ctgtcccttc ctcctcccgt tgctcctggt ggccaggaga      60
gcccttcacc ccacacagct gaggtggaga gtgaggcctc accacctcct gctcggcccc     120
tcccagggga agccaggctg gcgcccatct ctgaagaggg aaagccgcag cttgttgggc     180
gtttcccaag tgacttcatc caaggaaccg gctgagcctc ttcccttgca gccaacatcc     240
cccactctct ctggttctcc aaaaccttca accctcagc tcacttcaga gagctcagat     300
acagaggaca gtgctggagg cgggccagag accagggaag ctctggctga gagcgaccgt     360
gcagctgagg gtctgggggc tggagttgag gaggaaggag atgatgggaa ggaaccccaa     420
gttggggggca gcccccaacc cctgagccat cccagcccag tgtggatgaa ctactcctac     480
agcagcctgt gtttgagcag cgaggagtca gaaagcagtg gggaagatga ggagttctgg     540
gctgagctgc agagtcttcg gcagaagcac ttgtcagagg tggaaacact acagacacta     600
cagaaaaaag aaattgaaga tttgtacagc cggctgggga agcagccccc accgggtatt     660
gtggccccag ctgctatgct gtccagccgc cagcgccgcc tctccaaggg cagcttcccc     720
acctcccgcc gcaacagcct acagcgctct gagcccccag gccctggtga gactgcagtc     780
```

```
acccagcttc catcttttcc ctgagacccc tttctgtcga ctgtttttct ccaggccctg    840
ggggtctgcc ccggggggaat agaccccctc tccccacctc ccctttcctc acttagtgct    900
ctccttcccc catcctggct ccaggcatca tgcgaaggaa ctctctgagt ggcagcagca    960
ccg                                                                   963
```

```
        <210> 139
        <211> 376
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(376)
        <223> n = a,t,c or g
```

```
        <400> 139
cgccgctttg tttctcaaga gactgggaat ctgtatattg ccaaagtaga aaaatcagat     60
gttgggaatt atacctgtgt ggttaccaat accgtgacaa accacaaggt cctggggcca    120
cctacaccac taatattgag aaatgatgga gtgatgggtg aatatgagcc caaaatagaa    180
gtgcagttcc cagaaacagt tccgactgca aaaggagcaa cggtgaagct ggaatgcttt    240
gctttaggaa atccagtacc aactattatc tggcgaagag ctgatggaaa gccaatagca    300
aggaaagcca gaagacacaa gtcaagagtg gggaaanntc ttgagaaatc ccttaatttt    360
tcagcaggga ggatgc                                                     376
```

```
        <210> 140
        <211> 968
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(968)
        <223> n = a,t,c or g
```

```
        <400> 140
gcaaggggca gttggtgaac ttgctgcctc cagagaattt tccctggtgt ggaggcagcc     60
agggacccag gatgctccgg acctgttacg tgctctgttc ccaagctggt ccccgctcca    120
ggggctggca gtccctgagc tttgatggcg gggccttcca ccttaagggc acaggagagc    180
tgacacgggc cttgctggtt ctccggctgt gtgcctggcc cccactcgtc actcacgggc    240
tgttgctcca ggcctggtct cggcgactcc tgggctcccg gctctcaggc gcatttctcc    300
gagcatccgt ctatgggcag tttgtggctg gtgagacagc agaggaggtg aagggctgcg    360
tgcagcagct gcggaccctc agcctccgac cactgctggc agtgcccact gaggaggagc    420
cggactctgc tgccaagagt ggtgaggcgt ggtatgaggg gaacctcggt gctatgctgc    480
ggtgtgtgga cctgtcacgg ggcctcctgg agccccccag cctggctgag gccagcctca    540
tgcagctgaa ggtgacggcg ctgaccagta ctcggctctg taaggagcta gcctcgtggg    600
tcagaaggcc aggagcctcc ttggagctga gccccgagag gctggctgaa gctatggact    660
ctgggcagaa cctccaggtc tcctgcctca atgctgagca gaaccagcac ctccgggcct    720
ccctcagccg cctgcatcgg gtggcacagt atgcccgggc ccagcacgtg cggctcctgg    780
```

```
tggatgcgga gtacacctca ctgaaccctg cgctctcgct gctggtggct gccctggctg    840
tgcgctggaa cagcccgggt gaaggcgggc cctgggtgtg gaacacctac caggcctgtc    900
taaaggacac attctagcgg ctggggaggg atgcanaggc tgcgcacagg gccggcctgg    960
ccttcggg                                                              968
```

```
        <210> 141
        <211> 306
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 141
agacggctga aaagggaggg gtattgaggg cggttcagag ggcgaggaga ggggcgtaga     60
gaacctgtgg agaagaagtt cactggaggg gcattaggcc tcgcactatg tatccagatc    120
atcagtaggg gaagagaaaa gatgggcaat atgtatagtc agacgagaag tgggatcaaa    180
cagagggctc atggagaagt aggctaccca ccacataacc ccatcatagg attgcaggag    240
atacagctat agataagaat atccaccagt cggtgagtga gcagatcaag aagaactttg    300
ccaaga                                                               306
```

```
        <210> 142
        <211> 316
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 142
ccacactcac atttaatata ctgttaggtt gtttactttg aggcaatgtc atcctcatta     60
gtatagggca ttatattcct gaatagcaga atactcctcc attcatgaag ttcagtatta    120
tacattctta ttattgcaca acaaatagaa gactttggat ttccttatat aagtaccttg    180
acagatgact aacccatttt tcctatgctt tacaactatg atcagtaact gtaatttttt    240
taaaggtcct cctggacccc cgggtgaaaa aggagatcga ggtcccactg gagaaagtgg    300
tccacgagga tttcca                                                    316
```

```
        <210> 143
        <211> 339
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 143
gacaatacca aatgaatgaa cgtgactgtg ttccaacaaa actttatttta caaaaacagg     60
gatgggccgg atgtagccag aggccataat ttgccaaccc ctgatttaga cgaaggaaag    120
gagcagtgct tcactgcttt taaattaatt ctgtattctc acaaggccta cattgaaatg    180
```

61

```
gaattatagc ctcatttttt cttagaacct ttatattttg ttttattcat atacagggtt      240
gtcaagctgg acagactatt aaagttcaag tctcctttga tttgcttagt ctgatgttta      300
catttgtaag tccatgtacc aacgatttaa tcatacacg                              339
```

```
            <210> 144
            <211> 2018
            <212> DNA
            <213> Homo sapiens
```

```
            <400> 144
            acaagttatc tgtgaatcat aggagaacac atcttacaaa actcatgcac actgttgaac      60
            aagctacttt aaggatatcc cagagcttcc aaaagaccac agagtttgat acaaattcaa     120
            cggatatagc tctcaaagtt ttctttttg attcatataa catgaaacat attcatcctc      180
            atatgaatat ggatggagac tacataaata tatttccaaa gagaaaagct gcatatgatt     240
            caaatggcaa tgttgcagtt gcatttttat attataagag tattggtcct ttgctttcat     300
            catctgacaa cttcttattg aaacctcaaa attatgataa ttctgaagag gaggaaagag     360
            tcatatcttc agtaatttca gtctcaatga gctcaaaccc acccacatta tatgaacttg     420
            aaaaaataac atttacatta agtcatcgaa aggtcacaga taggtatagg agtctatgtg     480
            cattttggaa ttactcacct gataccatga atggcagctg gtcttcagag ggctgtgagc     540
            tgacatactc aaatgagacc cacacctcat gccgctgtaa tcacctgaca cattttgcaa     600
            ttttgatgtc ctctggtcct tccattggta ttaaagatta taatattctt acaaggatca     660
            ctcaactagg aataattatt tcactgattt gtcttgccat atgcattttt accttctggt     720
            tcttcagtga aattcaaagc accaggacaa caattcacaa aaatctttgc tgtagcctat     780
            ttcttgctga acttgttttt cttgttggga tcaatacaaa tactaataag ctcttctgtt     840
            caatcattgc cggactgcta cactacttct ttttagctgc ttttgcatgg atgtgcattg     900
            aaggcataca tctctatctc attgttgtgg gtgtcatcta caacaaggga tttttgcaca     960
            agaattttta tatctttggc tatctaagcc cagccgtggt agttggattt tcggcagcac    1020
            taggatacag atattatggc acaaccaaag tatgttggct tagcaccgaa aacaacttta    1080
            tttggagttt tataggacca gcatgcctaa tcattcttgt taatctcttg gcttttggag    1140
            tcatcatata caaagttttt cgtcacactg cagggttgaa accagaagtt agttgctttg    1200
            agaacataag gtcttgtgca agaggagccc tcgctcttct gttccttctc ggcaccacct    1260
            ggatctttgg ggttctccat gttgtgcacg catcagtggt tacagcttac ctcttcacag    1320
            tcagcaatgc tttccagggg atgttcattt ttttattcct gtgtgtttta tctagaaaga    1380
            ttcaagaaga atattacaga ttgttcaaaa atgtcccctg ttgttttgga tgtttaaggt    1440
            aaacatagag aatggtggat aattacaact gcacaaaaat aaaaattcca agctgtggat    1500
            gaccaatgta taaaaatgac tcatcaaatt atccaattat taactactag acaaaaagta    1560
            ttttaaatca gttttctgt ttatgctata ggaactgtag ataataaggt aaaattatgt    1620
            atcatataga tatactatgt ttttctatgt gaaataggtc ctgtccaaaa atagtattgg    1680
            ccagatattt gggaaaagta aattgggttt cctcagggag tgatatcccc ttgcacccaa    1740
            gggaaaagat tttctttcta acacgagaag tatatgaatg tcctgaaggg aaaccctggg    1800
            ccttgatatt tctgtgactc gtgttgcctt tgaaactagt cccctaccac ctcggtaatg    1860
            agctccatta cagaaagtgg aacataagag aatgaagggg cagaatatca aacagtgaaa    1920
            agggaatgat aagatgtatt ttgaatgaac tgttttttct gtagactagc tgagaaattg    1980
            ttgacataaa ataaagaatt gaagaaacaa aaaaaaaa                            2018
```

```
            <210> 145
            <211> 429
            <212> DNA
            <213> Homo sapiens
```

```
          <400> 145
ggcacgaggg aagctgcccc gtccaggttc atgttcctct tatttctcct cacgtgtgag      60
ctggctgcag aagttgctgc agaagttgag aaatcctcag atggtcctgg tgctgcccag     120
gaacccacgt ggctcacaga tgtcccagct gccatggaat tcattgctgc cactgaggtg     180
gctgtcatag gcttcttcca ggatttagaa ataccagcag tgcccatact ccatagcatg     240
gtgcaaaaat tcccaggcgt gtcatttggg atcagcactg attctgaggt tctgacacac     300
tacaacatca ctgggaacac catctgcctc tttcgcctgg tagacaatga acaactgaat     360
ttagaggacg aagacattga aagcattgat gccaccaaat tgagccgttt cattgagatc     420
aacagcctc  .                                                          429
```

```
          <210> 146
          <211> 717
          <212> DNA
          <213> Homo sapiens
```

```
          <400> 146
gatgaaactt ccggtctcat tgtccgggaa gtgagcattg agatttcgcg ccagcaagtg      60
gaagaactct ttggacctga agattactgg tgccagtgtg tggcctggag ctcagcgggt     120
accacaaaga gccggaaggc gtatgtgcgc attgcatagg aactcatgac ctgacatcca     180
ttagcagagt catcagagtc atctggctgc tgtgttgaga atggaccatg ctgggcaagg     240
ggagaagcag gaagaccagt gatgagactg cagctatgag agatgttaag ctactgtaga     300
ttggaagcag tggaggtggt gaggccagga tttcagatat atttaaaagt agagataaca     360
gcttttgttg agaccttgga tgtgtgatgt gagagaaaga agagaaagga tgattttgaa     420
agggcctaag cctttatcca aggatttctt tcaaatgtct ttagtgaagc cattcctgcc     480
tcacagaggg aggaggctgg gcattccttt ctcaatactt tcagagcagt ttgtccatac     540
ccctaatata gtgcttgtct catttcgaat tatattcact cgtaaaattt gtgtttcatg     600
ccagtgagtt ccatgagatc aagaattcta ttgtacttaa ttttatatct ctcctgctta     660
gcacaatacc tagagtatca cagatgttta acaattttct tgaattaaaa ctgttat       717
```

```
          <210> 147
          <211> 367
          <212> DNA
          <213> Homo sapiens
```

```
          <400> 147
ggcacgagat cgattcatgt aaagctggac gtgggcaagc tgcacaccca gcctaagtta      60
gcggcccagc tcaggatggt ggacgacggc tctgggaagg tggagggcct acctgggatt     120
tgaccagagt ccgcctggct ccaggctctg ccacccacag gaagaagaaa ctacactgac     180
agatgtgaga cagtgtttcc ccttcagtct ttgaacaggc tttgtgtttt ctaaatgaca     240
ctggataaaa gggaattcat tcaagagctc caaggcttcc ctttccgccc ggcttctgtt     300
gccctggcct gagcagcgag cagctgggag gggactgaac tgcccctaac cagggttgtg     360
gctggcg                                                              367
```

```
<210> 148
<211> 791
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(791)
<223> n = a,t,c or g


<400> 148
cgagacccga ccctgggcgt ggtgcatcga ggtagatgca aagatgctgg ccagagcaag    60
tgtcgcctgg agcgggctca agccctggag caagccaaga agcctcagga agctgtgttt   120
gtcccagagt gtggcgagga tggctccttt acccaggtgc agtgccatac ttacactggg   180
tactgctggt gtgtcacccc ggatgggaag cccatcagtg gctcttctgt gcagaataaa   240
actcctgtat gttcaggttc agtcaccgac aagcccttga gccagggtaa ctcaggaagg   300
aaagatgacg ggtctaagcc gacacccacg atggagaccc agccggtgtt cgatggagat   360
gaaatcacag ccccaactct atggattaaa cacttggtga tcaaggactc caaactgaac   420
aacaccaaca taagaaattc agagaaagtc tattcgtgtg accaggagag gcagagtgcc   480
ctggaagagg cccagcagaa tccccgtgag ggtattgtca tccctgaatg tgcccctggg   540
ggactctata agccagtgca atgccaccag tccactggct actgctggtg tgtgctggtg   600
gacacagggc gcccgctgcc tgggacctcc acacgctacg tgatgcccag ttgtgagagc   660
gacgccaggg ccaagactac agaggcggat gacccctttca aggacaggga gctaccaggc   720
tgtccagaag ggaagaaaat ggagtttatc accagcctac tggatgctct caccactgac   780
atggntcagg g                                                        791
```

```
<210> 149
<211> 335
<212> DNA
<213> Homo sapiens


<400> 149
ggcacgagca aactcggggc tcagcttggg gacgggagtt gatagtcagg tgcctggaac    60
ataatggaga ccgtccatat tggttgaatg agtggatgaa tgaattaatg aatttctttt   120
ctcttaagtc ctgcagctga ttaagtcaca gaaatttctg aataagttgg tgatcttggt   180
ggaaacggag aaggagaaga tcctgcggaa ggaatatgtt tttgctgact ccaaagtaag   240
tgacagcaaa cttctaaagt gggctgtgag gtagggaggg acacaagcg ttttgaggct   300
cgctgtgtgc cagggagtgt atcattagct cactc                              335
```

```
<210> 150
<211> 1293
<212> DNA
<213> Homo sapiens
```

```
<400> 150
cgacgcctgt ccctcttaga cttgcagctc ggtcctcttg gcagagaccc cccgcaggag     60
tgcagcacct tctccccaac agacagcggg gaggagccgg ggcagctctc ccctggcgtg    120
cagttccagc ggcggcagaa ccagcgccgc ttctccatgg aggacgtcag caagaggctc    180
tctctgccca tggatatccg cctgccccag gaattcctac agaagctaca gatggagagc    240
ccagatctgc ccaagccgct cagccgcatg tcccgccggg cctccctgtc agacattggc    300
tttgggaaac tggaaacata cgtgaaactg gacaaactgg gagagggcac ctatgccaca    360
gtcttcaaag ggcgcagcaa actgacggag aaccttgtgg ccctgaaaga gatccggctg    420
gagcacgagg agggagcgcc ctgcactgcc atccgagagg tgtctctgct gaagaacctg    480
aagcacgcca atattgtgac cctgcatgac ctcatccaca cagatcggtc cctcaccctg    540
gtgtttgagt acctggacag tgacctgaag cagtatctgg accactgtgg gaacctcatg    600
agcatgcaca acgtcaaggt gaggcctcgg gggcagggtc cccccatctt ggcagccacc    660
tgtccagaag cccagtgtgg ggacccactc tcaccaccag ggatccggct gctgaggtgg    720
ctcaaacctt cccacgtagg aaagagggag agggcaatgc catcaacgag tccaggaact    780
gggttgagcg ctttacccca agaacagaca cacactgtct gccactgtct agctgttggt    840
ataaaaccca ctctcaactc tgaacatcag tttcccagtc tgtcaaatgg gagtgtgagc    900
tacctgccaa aatgcaggga ggcttctggg gaagctcggg gttatgaatg acctctcctg    960
gtgtttgtta aagaatcaag actgggcatg gtggcccacg cctgtaatcc cagcactggg   1020
aggccaaggc aggaagatgg cttgagccca ggagtttgag accagcctgg gcaacatggc   1080
aagacctcat ctctactaaa aattgaaaaa ttagccgggc acagtagcgt gcacccatag   1140
tcccagctgc ttgagaggct gaggcaggag ggccacttga gcccgggagg ttgaggctgc   1200
agtgagccat gatcacacca ctgcactcca gcatgggtga cagagtaaaa ccctgacatg   1260
tattgcgggc gctctagagg ataacaagca tac                                1293
```

```
<210> 151
<211> 349
<212> DNA
<213> Homo sapiens
```

```
<400> 151
ggcacgagcg gcacgagcct tctcctactg cattagcatt tggggaccac cctattgtac     60
aaccaaagca attatccttt aaaattattc aggtaaatga taattaaaat gttttttct     120
atggcttcta agaaaccatt gactaactta ctaacaacta agatgtctgt ttgtttttata    180
tgtagtcata aagcagaatt acacatcaag aaagataact tactaaacaa aaacaacaga    240
atttgtagga aggagtgaga aactgaaaca cacaatttac tatcagcttt ttaaacaacc    300
gttaacatgt cagttctgtt tactgattct ttctgaactt aatttccag                 349
```

```
<210> 152
<211> 324
<212> DNA
<213> Homo sapiens
```

```
<400> 152
ggcacgagga ccttccttgc tttcagaatt tcacccaggg tctgacaggc ctcaagaaag     60
gagaactagt tatgaaccga ttcatccagg cccatcccca gtggatcatg attcactgga    120
atcgaagcga ccacgtctgg aacaggcttc tgattctcat tatcagggtc acatcactgg    180
cgaatcccta ccaggacgtg tacactagca gctcctcact gtggaatctg atgggcaatg    240
```

65

```
ccatggtgat tacccactat atccgtctta ccccatatgt tcaaagtaaa ctcggttccc    300
tagggaacct gatgccatgt tacc                                          324
```

```
<210> 153
<211> 377
<212> DNA
<213> Homo sapiens
```

```
<400> 153
ggcacgagaa aagaagaatt cagtgcagaa gaaaattttc tcattttgac ggaaatggca     60
accaatcatg tacaggttct tgtagaattc acaaaaaagc taccaggtat tttttaaata    120
atcacagtta atatttattg agagtttaaa tatgtgccca cagattagat tacctatttt    180
acatacggtg ttttaatttt caaaacattc ctgtgagatc agctctattt tcactattac    240
tttgccaagt attttcacat gtacttattt cactgctatt ctctacaata gtcttgtgac    300
attgagaaag gcaggtctgt tctttgtaaa atgaaaatca tttaatatct gatttaaagt    360
aactgtcgaa ctactat                                                  377
```

```
<210> 154
<211> 1224
<212> DNA
<213> Homo sapiens
```

```
<400> 154
ggtttttttt tttttctttt tgggaaaggc attggccact ttggacttta ttagcaacag     60
taatgtcccc tgacatacgc acaagcttgt agctccacgg ccaggtcttc ccccaacctc    120
acaatggccc cgtgatgcag gcaggcaggc gagtgggggt ctcccctcct tatccacagg    180
gccaccgaaa ggcccacgag acggccttgc ccgaggtcac ccagcggagt ggcttgctgg    240
gagccctggg aataacagtc ccacacaagg ctctctccct ccgcagctgg acctgtacgc    300
gggggctctg tttgtgcaca tctgcctggg ctggaacttc tacctctcca ccatcctcac    360
gctcggcatc acagccctgt acaccatcgc aggtatggtg cctgcagcag ggaggtccac    420
ccaggggacg tgtaaagggg tcagaaggcc acctccccct acaggcccga gggagcagcc    480
caggaagtgg ccccagcagg agccccagaa gttcctcccc gtgtccctcc tccctggggc    540
cagggccccc tccagcaacc ttgcttccac tggcaggggg cctggctgct gtaatctaca    600
cggacgccct gcagacgctc atcatggtgg tgggggctgt catcctgaca atcaaaggtg    660
aggacagagt ctgtggccat ggcggggctg tccccacagc gagccctttg gagtctggca    720
ctgcccggca ctgtgcagga ttcatgccgt tggggttctg ggtagcatcg ctgggagtgg    780
gtgggttcag gaggttgagc cactaggcag tcagcccccc tgctggcccc tcagggactg    840
ccctggctgg tagaggctac ccaccctgct gccccgctgt taccagctct ggccctggca    900
aggagctgac tcaggaactc agggccagcc acaccgcat tggctcagcg cttgatggtg     960
aggtggggct gtaggcgggt gtgaaggcac acaaccagga ggccataaaa ctgcctgggc   1020
agctcctcca attgtttaaa agcatgtaca aaatgccaag aggtgatgct acctcctgca   1080
ggacaaaggc cagggaggaa agaagagagc tgggagagat tggcgatact agtctggaac   1140
agataggaaa ctcacagggc tgcccggaga gagcgtgagc tcaccgtccc tggaagtatg   1200
taagcagagc caggagctcg tgcc                                         1224
```

```
<210> 155
<211> 345
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(345)
<223> n = a,t,c or g




<400> 155
ggcacgagcg gcacgagatc tgaagaggta tattgcttac agaaagagcg ggagatggta      60
aatcacagtc ttcaagagac ttctgagcaa aacgttattc tacagcatac tcttcagcaa     120
cagcagcaaa tgttacaaca agagacaatt agaaatggag agctagaaga tactcaaact     180
aaacttgaaa aacaggtgtc aaaactggaa caagaacttc aaaaacaaag ggaaagttca     240
gctgaaaagt tgagaaaaat ggaggagaaa tgtgaatcag ctgcacatga agcagatttg     300
aaaaggcaaa aagtgattga gcttactggc actgccaggc aagtn                     345




<210> 156
<211> 340
<212> DNA
<213> Homo sapiens




<400> 156
ggcacgagct tctacttgta caggaaaggt tacttgagtt tgtccaaagt ggtgccgttt      60
tctcactatg ctgggacatt gctgctactt ctggcacgtg tggcctgcct cctaggcatt     120
gtccgctggg cctaccccca cttcccgcag tttctcgcca tctcctctcc gatccatctc     180
tacctgacgt cataactcta tatgcatgtt atgcggtcca tcttagtctt ctaaaaaggc     240
cattttagct tacctgccat caagctatac atgtggaaat atacactgta ttattttccc     300
tttccaggtg attacttacc tcatctgttc ttatatctgc                           340




<210> 157
<211> 478
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(478)
<223> n = a,t,c or g




<400> 157
gagactccaa gccccagttt cacctcagag gcagagatga ggggtccccc ggtcctgctc      60
```

```
ctccaggccg ccccaatgga gtgtcctgtt ccgcagggga tcccggccgg gtccagtcct    120
gagcctgcac ctgacccccc ggggcctcat ttcctccggc aggagcgcag cttcgagtgc    180
cgcatgtgcg gcaaggcctt caagcgctcg tccacgctgt ccacccacct gctcatccac    240
tcagacacgc ggccctaccc ctgccagttc tgcggcaagc gtttccacca gaagtccgac    300
atgaagaagc acacctacat ccacacaggt gagaagccgc acaagtgcca ggtgtgcgga    360
aaggccttca gccagagctc caacctcatc acccacagac tcagagagaa cccaccatgg    420
tgctgtctcc tgccgacaag accaacgtca aggccgcctg gngtaagggt cgcgcgca     478
```

<210> 158
<211> 332
<212> DNA
<213> Homo sapiens

<400> 158
```
ggcacgagca gctcaccaac aacacagcca ctgcccctc tgccacgccc gtgtttgggc    60
aagtggcagc cagcaccgca ccaagtctgt ttgggcagca gactggtatc acagccagca    120
cagcagttgc cactccacag gtaatcagct caaggttcat taatctagat ttttagtata    180
tagtattatt gaatatatat aatgttttat atattagact ttatacttga gacataggaa    240
ataatttatg tataactgtt aattaaattt tatatttgct agattagaaa attctattaa    300
tttattaatg aattatatct aattatgtga ca                                  332
```

<210> 159
<211> 868
<212> DNA
<213> Homo sapiens

<400> 159
```
cccacgcgtc cggaataaag agagaactct gttactattg tttttacatc accaaataat    60
tatttaatat cgttagctaa gagaagaatt ggctatgaac tgtactttaa caactgacac    120
aactgcatac aagttataaa gtttaataat ctttatcatc ttggaaaata aatctcttct    180
tgctaagtat cagtttttaa aaattgcccc atgtattaga tatgtatttt tttaacaaaa    240
atgttctgtg tattaattat tttgaaataa attttaagtt cacaaaaagc cattacaaga    300
agtggaaata gcagcaatta cacatggtgc tcttcaggga ttagcctact tacattctca    360
tactatgatt catagagata tcaaagcagg aaatatcctt ctgacagaac caggccaggt    420
gaaacttgct gactttggct ctgcttccat ggcatcacct gccaattcct ttgtgggaac    480
gccgtattgg atggccccag aagtaatttt agccatggat gaaggacaat atgatggcaa    540
agtagatgtg tggtctcttg gaataacatg tattgaacta gcggaaagga agcctccttt    600
atttaatatg aatgcaatga gtgccttata tcacatagcc caaaatgaat cccctacact    660
acagtctaat gaatggtgag tattgttaat atatatattg ctcagtgttg aataaatgaa    720
atgcttttc ataatctgtt atcaaagtga tttaatttca gttaggtaaa atgtatcacc    780
ttataagata ttaaaataga tgtattttac ccttttaaat atatttattc tttatcatgt    840
ttccatttca tggcatacgt ataactgg                                       868
```

<210> 160
```

<211> 1404
<212> DNA
<213> Homo sapiens


<400> 160
gcgccacgcg cggcctggcg gcggcggcca ctctaaccag cgcaaaatgt ccctggaaca      60
ggaggaggaa acgcaacctg ggcggctcct aggacgcaga gacgccgtcc ccgccttcat     120
tgagcccaac gtgcgcttct ggatcaccga gcgccaatcc tttattcgac gatttcttca     180
atggacagaa ttattagatc ctacaaatgt gttcatttca gttgaaagta tagaaaactc     240
gaggcaacta ttgtgcacaa atgaagatgt ttccagccct gcctcggcgg accaaaggat     300
acaggaagct tggaagcgga gtcttgcaac agtgcatccc gacagcagca acctgatccc     360
caagcttttt cgacctgcag cgttcctgcc tttcatggcg cccacggtat ttttgtcaat     420
gacgccactg aaagggatca agtccgtgat tttacctcag gttttcctct gtgcctacat     480
ggcagcgttc aacagcatca atggaaacag aagttacact tgtaagccac tagaaagatc     540
attactaatg gcgggagccg ttgcttcttc aactttctta ggagtaatcc ctcagtttgt     600
ccagatgaag tatggcctga ctggcccttg gattaaaaga ctcttacctg tgatcttcct     660
cgtgcaagcc agtggaatga atgtctacat gtcccgaagt cttgaatcca ttaaggggat     720
tgcggtcatg gacaaggaag gcaatgtcct gggtcattcc agaattgctg ggacaaaggc     780
tgttagagaa acgctagcat ccagaatagt gctgtttggg acctcagctc tgattcctga     840
agtcttcacc tactttttta aaaggaccca gtatttcagg aaaaacccag ggtcattgtg     900
gattttgaaa ctgtcttgta ctgtcctggc aatgggactg atggtgccat tttcttttag     960
tatatttcca cagattggac agatacagta ctgtagtctt gaagagaaaa ttcagtctcc    1020
aacagaagaa acagaaatct tttatcacag aggggtgtag gccgtgagtt ttaggtgaat    1080
ttatgtggtt ccctgcttga aaaccttccc cctctcccag gttcggttta gagaactttg    1140
cccacaggtc ttctggggac cccagaggtg tctgtgctga caaggcgact tcagattcca    1200
tactgagatc gttcccaggc tggcgtctct gggggttttta aggctggctg gagaagacag    1260
tgggaagggt gccccgtctg acacccctgg ggttgctgag ggaacggttg gagtggggat    1320
cggcctgcga aaggatactg tgaaatcact aattaactaa taaacctgtc tcaagttgag    1380
gatttgaaga aaaaaaaaaa aaag                                           1404




<210> 161
<211> 562
<212> DNA
<213> Homo sapiens




<400> 161
cccacgcgtc cgggagattg gaagtcttct ataacgggac ctggggcagc gtcggcagga      60
ggaacatcac cacagccata gcaggcattg tgtgcaggca gctgggctgt ggggagaatg     120
gagttgtcag cctcgcccct ttatctaaga caggctctgg tttcatgtgg gtggatgaca     180
ttcagtgtcc taaaaacgcat atctccatat ggcagtgcct gtctgcccca tgggagcgaa     240
gaatctccag cccagcagaa gagacctgga tcacatgtga agatagaata agagtgcgtg     300
gaggagacac cgagtgctct gggagagtgg agatctggca cgcaggctcc tggggcacag     360
tgtgtgatga ctcctgggac ctggccgagg cggaagtggt gtgtcagcag ctgggctgtg     420
gctctgctct ggctgccctg agggacgctt cgtttggcca gggaactgga accatctggt     480
tggatgacat gcggtgcaaa ggaaatgagt catttctatg ggactgtcac gccaaaccct     540
ggggacagag tgactgtgga ca                                              562




<210> 162

<211> 1812
<212> DNA
<213> Homo sapiens

<400> 162
```
gccttgcttg gaggcaaagc gtcctccact ctgtcctcag gactcagctg tgtggccttg   60
gatttctttt tgcgggactt gcgcccttg ggtgccaacg gtccaggatc cccctggaac   120
cagatggtac ggccatgccg gtcctgcagg gagctcatgc ctggcatgcc atagcagcgc   180
agccaggctc gaaaggcagc aaagtcctcc tccccgctct ctgacccgta gccctgccc   240
cccaactgga ccacttcctt gggcactgag tgacatagct ccagcaggtc tggattctgc   300
agcttggtcc ttatcttctg gctcagggtc agctccgggc tcggcctgtg ctgctgcagg   360
gcctccagga ccgagcgggc cttctcaaag gggggatct tcagccggta caggatctct   420
gcccgcagat agttgccaat gccattgaag aacctctggt ccaggagggc ctcgcagatg   480
ggccggtcaa aggccttatc cgctaggttt cgtagcacat tctccctgaa ctgctggtac   540
tcctgcaaga cacagggccc gcggcccggc tgccactttc ccccaaggtc ccagcggccg   600
aaccggcgga tgtccacgaa acatagggcg agccgggggc caggcggggc cgtgtaaaag   660
cgcaggtggg catggcgtgg cagctcctcg cggggcacca gctgaaaaga gccggacatg   720
ccgaagcgga agaccagggc cagtggctcc tgttggggct gggccccagg cagagggctc   780
agtatcaggc gcagctcctt gccgcgggct gaagctgaga tgcggtaggc actgctctca   840
aagggcacct cagggttgcg gctgacagag gacttctcca cgcagccgcc gaacaccagc   900
gccctgcagg cctcattcac aaactggctg gccaggtgca gctcggggcc ctcaggcatc   960
ctgagggagg gtggcagagt cctggctggg aggtggcgga agaacctgac ttcccactgc   1020
ctggcgccgg cgagatgcgg gggcaggtct gaggccccgg gtcgccgctg tctctgcggt   1080
tgggggaagt cacccagcta gcgtgggaca gggtcggcac ccccagcagg aaacagcagc   1140
gacgagccag agcggagtcg cctgcagctg cgcgcaggac gtgcacaggt gcgcggtacg   1200
cacaggccct agggacccgg tggggatctt aagcaccaac gaacagtcag acctaactca   1260
taaacaaaca tcatcacggc ctgccctgtc agaagcgcag ccaagcaaca acaacaacaa   1320
aaaaaggcga ggaggtagac ccacttgaga tggttctgtt gcggagagtc tctgaaatca   1380
gaaagcgcca gtccgcaaaa acgaggaaac ccgacgtgtc cggcggaagg aaccgccagt   1440
acaaaggccc tgaggcgaga aagagattgg tcactgaaag aactcaaaga agtcctgtgt   1500
ggctggagta tagctgcggg ttagtgctgg caggtgaaga cagagaagca aacccaggtc   1560
aggtccggtt gggcctcggg agggcctccg tgtggagtct gcacttcatt ctaagtgtat   1620
acctaacccca tcgccacgat ttcccctcct tcacactacc ctgctacgtc tccttattag   1680
gcgtaataaa attatgtggc tttgtaagaa attggtttt agagatgcat gttaaagtat   1740
tgggtatgaa atgtcatgat ttgtctaatt tactttaaaa tacttctgcc ataataaatg   1800
aatagaatta ac   1812
```

<210> 163
<211> 333
<212> DNA
<213> Homo sapiens

<400> 163
```
agctgacgtg gtctgcctgt tattggagag atatattaag aatccagttg tggattgcag   60
ctgatattct tttgcgaatg cttgaaaaag cacttcttta tagtgaacac cagaacatca   120
gcaacactgg actgtcatcc caaggcttat tgatatttgc ggagttgatt cctgccatta   180
agaggacgtt ggctcgcctt ctcgtgatca ttgcgagcct ggactatggc attgagaaac   240
ctcatttagg aacaggcatg caccgtgtga tcggactgat gcttctatac ttaatctttg   300
caaatgctga aagcgtgatt agagtcattg ggg   333
```

```
<210> 164
<211> 134
<212> DNA
<213> Homo sapiens




<400> 164
tttttttttt gagatggagt ctcgctctgc tgcccaggct ggagtgcagt ggtgcaatct      60
tggctcactg caagctctgc ctcccaggtt cacgccattc tcctgcctca gcctcccgag     120
tagctgggac taca                                                       134




<210> 165
<211> 839
<212> DNA
<213> Homo sapiens




<400> 165
cctgagcccg gcgagcagga gaggaggtct tccgggccgc ggcctccgag cgcgcgggat      60
ttgcagaact taatatgaat gtgaagaact tgcaaagaaa cttgaaaaca gccaaaggga     120
tggcatatca agaaataaat tggccttggc agaattgtat gaagatgaag tgaagtgcaa     180
atcttccaag tctaatagac ctaaagccac agtcttcaag agcccacgga caccacctca     240
acggttttac tcaagtgaac atgaatacag tggattaaat atagttcgac cttcaactgg     300
gaaaattgtg aatgaacttt tcaaagaggc aagggaacat ggggctgtcc ctctgaatga     360
agccacaaga gcttcaggtg atgataaatc taagtcattt acaggtggag gatacagatt     420
gggtagttct ttttgtaagc ggtctgaata tatctatgga gaaaatcagc tgcaagatgt     480
tcagattttg cttaaactgt ggagcaatgg tttcagttta gatgatggag aattgagacc     540
ttacaatgaa ccaacaaatg ctcaatttct ggagtctgtt aagagagggg tgactctcat     600
tgcatgtatg cctgaaattc agcaacttat gttagaaatc ttttaatgtg gcattactgc     660
tggcagaaga tttcaaaagg ttagtttgaa gttataattt gtgaaagtaa actcagatat     720
tcagtgctct cacccatcca aagaacattg taacttacca gctcttcttg ctaaaggatg     780
aggaatcaag tgattttgct atgataataa aagctttct gtgttatgat taaaaaaaa     839




<210> 166
<211> 1256
<212> DNA
<213> Homo sapiens




<400> 166
ctcgatcacc tgatggccct gcggcgcagc tcccgggttg acccacgcgt ccgagcggat      60
gttcactctc acgaccatga ttcaagctct tgcacctgtt atgggatggg acaggaagcc     120
actgaagatg tttttcatcag aagagatgag aggacatctt catcatcatc ataaatgtct     180
gacgaagatc ctgaaggttg aggggcaggt tccagatctg ccatcctgcc tgcccctgac     240
tgacaacacc cgcatgctgg cctctatcct catcaacatg ctctatgatg acctgcgctg     300
```

```
tgacccggag cgcgatcact tccgcaagat ctgtgaggaa tatatcacgg gcaagtttga    360
cccccaggac atggacaaga acttgaatgc catccagaca gtgtcaggga tcctgcaggg    420
cccctttgac ctgggcaacc agctgctggg actgaaaggt gtgatggaga tgatggtggc    480
actatgtggc tcagagcgcg agacggacca gctggtggcc gtggaggccc tcatccatgc    540
ctccacgaag ctcagccgcg ccaccttcat catcaccaat ggagtgtcac tgctcaaaca    600
gatctacaag accaccaaaa atgagaagat caagatccgc acactggtgg gactctgtaa    660
gctcggctct gcaggtggca cagactacgg tctcaggcag tttgcggaag ggtcgacaga    720
aaaactggcc aaacagtgtc gcaagtggct gtgcaatatg tccatagaca ctcggacccg    780
acgctgggca gtggagggcc tggcctacct cacgctggac gctgatgtga aggacgactt    840
tgtccaggac gtccctgccc tgcaggccat gtttgagctg gccaagacca gtgacaagac    900
catcctgtac tcggtggcca ccaccctggt gaactgcacc aacagctacg atgtcaagga    960
ggtcatccca gagcttgtcc agctcgccaa gttctccaag cagcatgtgc ccgaggaaca   1020
ccccaaggac aagaaggact ttatagacat gcgggtgaag cggcttctga aggcgggtgt   1080
catctctgcc ctggcttgca tggtgaaagc agatagtgcc atcctcactg accagaccaa   1140
ggagctgctg gccagggtat tcctggcact gtgtgacaac ccaaaggacc gaggcaccat   1200
tgtggctcaa ggtggtggca aggccctgat tcccctggct ttggagggca cagatg       1256
```

```
        <210> 167
        <211> 892
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 167
atgtggacag cgtgggtggc ggcagcgagt ctcggtccct ggactcaccc acttccagcc     60
caggcgctgg cacgaggcag ctggtgaagg cttcgtccac aggcactgag tcctcagatg    120
actttgagga gcgagaccct gacctgggag acgggctgga gaatgggctg ggcagcccct    180
tcgggaagtg gacactgtcc agcgcggctc agacccacca gctgcggcga ctgcggggcc    240
cagccaagtg ccgcgagtgc gaagccttca tggtcagcgg gacggagtgt gaggagtgct    300
ttctgacctg ccacaagcgc tgcctggaga ctctcctgat cctctgtgga cacaggcggc    360
tcccagcccg gacacccctt tttgggggttg acttcctgca gctacccagg gacttcccgg    420
aggaggtacc ctttgtggtc acgaagtgca cggctgagat agaacaccgt gccctggatg    480
tgcagggcat ttaccgggtc agcgggtccc gggtccgtgt ggagcggctg tgccaggctt    540
tcgagaatgg ccgagcgttg gtggagctgt cggggaactc gcctcatgac gtctcgagtg    600
tcctcaagcg atttcttcag gagctcaccg agcccgtgat ccccttccac ctctacgacg    660
ccttcatctc tctggctaag accttgcatg cagaccctgg ggacgaccct gggaccccca    720
gccccagccc tgaggttatc cgctcgctga agacctcttt ggtacagctg cctgactcta    780
actacaacac cctgcggcac ctggtggccc atctgttcag ggtggctgca cgatttatgg    840
aaaacaagat gtctgccaac aacctgggca ttgtgtttgg gccgacactg ct           892
```

```
        <210> 168
        <211> 394
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 168
ggactccatg tcatctctct gcacagcgct gatggtcgtc actgggagga tccccttctt     60
gagcttgaca gtgaacgtgt gtctgcattt cttgtcactg agaccctggt gttctatttg    120
ttctgtctcc ttgcagatga aaccgtcgtg ccaccagatg ttccaagcta cctctcttct    180
```

```
cagggggaccc  tttctgaccg  acaagaaacc  gtggtcagga  ccgagggtgg  ccctcaggcc      240
aatgggcaca  ttgagagcaa  tggtaaggcc  tcagtaaccg  tgaagcagag  ctctgctgtg      300
actgtgtctc  tgggtgctgg  aggtggcctc  caggtcttta  cagggcaggt  acctggcatt      360
agatggggca  aacttggtga  agcccacgcg  tccg                                    394
```

```
         <210> 169
         <211> 550
         <212> DNA
         <213> Homo sapiens
```

```
         <400> 169
ctgtgacacc  tccgggcagc  ccggcacttg  ttgctcccac  gacctgttgt  cattcccttta     60
acccggcttt  ccccgtggcc  ccccgcctcc  tcccggcttc  gctcctttttc  atgtgagcat    120
ctgggacact  gatctctcag  accccgctgc  tcgggctgga  gaatagatgg  ttttgtgaaa      180
aattaaacac  cgccctgaag  aggagccccg  ctgggcagcg  gcaggagcgc  agagtgctgg      240
cccaggtgct  gcagaggtgg  cgcctccccg  gcccgggacg  gtagccccgg  cgccaacgg       300
catgacagac  tcggcgacag  ctaacgggga  cgacaggggac  cccgagatcg  agctcttttgt    360
gaaggctgga  atcgatggag  aaagcatcgg  caactgtcct  ttctctcagc  gcctcttcat      420
gatcctctgg  ctgaaaggag  tcgtgttcaa  tgtcaccact  gtggatctga  aaagaaagcc      480
agctgacctg  cgcaacctag  cccccggaac  gcacccgccc  tttctggcct  tcaactggta      540
cgtgaagaca                                                                  550
```

```
         <210> 170
         <211> 422
         <212> DNA
         <213> Homo sapiens
```

```
         <400> 170
cttggattca  gtgatggaca  ggaagccagg  cctgaagaaa  ttggctggtt  aaatggctat       60
aatgaaacca  cagggggaaag  ggggggacttt  ccgggaactt  acgtagaata  tattggaagg     120
aaaaaaatct  cgcctcccac  accaaagccc  cggccaccte  ggcctcttcc  tgttgcacca      180
ggttcttcga  aaactgaagc  agatgttgaa  caacaagtgc  tctacaagta  tagaaagaag      240
ccttcctctt  cccaccgtcc  ccagacacca  cataatggaa  aaagcaagaa  ttttctgcat      300
aagcaaggcc  ttaaaaaaaa  aaaagccagc  ctctgatggg  acttttttcc  tgccaaaaat      360
cccactggtc  cactgtcgca  atttttacaa  aaggccacga  taaaagagta  aggcccattt      420
tg                                                                          422
```

```
         <210> 171
         <211> 1042·
         <212> DNA
         <213> Homo sapiens
```

```
        <400> 171
cggacgcgtg gggtcatgga gctggcactg cggcgctctc ccgtcccgcg gtggttgctg      60
ctgctgccgc tgctgctggg cctgaacgca ggagctgtca ttgactggcc cacagaggag     120
ggcaaggaag tatgggatta tgtgacggtc cgcaaggatg cctacatgtt ctggtggctc     180
tattatgcca ccaactcctg caagaacttc tcagaactgc ccctggtcat gtggcttcag     240
ggcggtccag gcggttctag cactggattt ggaaactttg aggaaattgg gccccttgac     300
agtgatctca aaccacgaa aaccacctgg ctccaggctg ccagtctcct atttgtggat      360
aatcccgtgg gcactgggtt cagttatgtg aatggtagtg gtgcctatgc caaggacctg     420
gctatggtgg cttcagacat gatgggtctc ctgaagacct tcttcagttg ccacaaagaa     480
ttccagacag ttccattcta cattttctca gagtcctatg gaggaaaaat ggcagctggc     540
attggtctag agcttataaa ggccattcag cgagggacca tcaagtgcaa ctttgcgggg     600
gttgccttgg gtgattcctg gatctcccct gttgattcgg tgctctcctg gggaccttac     660
ctgtacagca tgtctcttct cgaagacaaa ggtctggcag aggtgtctaa ggttgcagag     720
caagtactga atgccgtaaa taaggggctc tacagagagg ccacagagct gtgggggaaa     780
gcagaaatga tcattgaaca ggtaaaaagg ggaaacactc agaggcgagc ctgcttggct     840
ttttctggtg ggtacagggc ccatggttgg tgttgtcaaa cttggagtct acactgaggc     900
tccccacata tctgcaaatg attgcatgct ggataataaa tctcttgggt ctaagcagtg     960
atgtagtggc tccttacaga gtcagaaagc cacccaggcc tgcaagactt gcttgtcctt    1020
cactaaatgt aaaaattcta tt                                             1042
```

```
        <210> 172
        <211> 890
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 172
aaagtagtag gttggtgcaa acgtagtaat aaattggttt ggccctgttt tcatagaact      60
atagaggttg gacctttgtc cccttccaga tgcctacaaa caaactgatg ttttttgattt     120
ttttttcttt ttaaattttg gttgccacta attcttataa aaatcctcac acaaggctgg     180
gctcagtggc tcacacctgt aatcccagca ctttgggagg ctgaggcagg cggatcacga     240
ggtcaggaga tcgagaccat cctggctaac acggtgaaac ccccgtctct actaaaaata     300
caaaaaatt agccgggcgt ggtggcgggc gcctgtagtc ccagctactc gggaggctga      360
ggcaggagaa tggcgtgaac ccgggaggca gagcttgcag tgagccgaga tagcgccact     420
gcactccagc ctgggcgaca gagcaagact ccatctcaaa aaaaaaaaa agtgataata      480
ctgtaatccc agcactttgg gaggccgagg caggcggatc acgaggtcag gagatcgaga     540
ccatcctggc taacacggtg aaaccccgtc tctactaaaa atacaaaaaa ttagctgggc     600
gtggtggcgg gcacctgtag tcccagctac ctgggaggct gaggcaggag aatggcgtga     660
acccaggagg cggagcttgc agtgagcgga gatcatgcca ctgcacttca gcctgggcga     720
cagagcaaga ctccatctca aaaaacacac acacacacac acacacacac acacacacaa     780
atagaaaaat aataatagtt ttaagcacct ctaaagtaca gatattgtgc caagcaattt     840
atgtgaattg attagattga taactctaaa aatagtttcc ctaatcaact                890
```

```
        <210> 173
        <211> 1922
        <212> DNA
        <213> Homo sapiens
```

```
<400> 173
tttctttctt catccaaaat agtagagatg tctttcccac gatgacctgt gatggtggag    60
atatctttc ctcggccaac tcctcctcca tcggcttctt tgatgtcatc ttcaatagct   120
tcatcaattg cttcatcaaa ctcatcaaat ctgtagctta tacatttcct tgttcttgtt   180
gacctccttt caaagcaagt ttgctttgga ttttttttgaa tctttttttct tttcttcttg   240
atcttcagaa aagtctggct ctttgtggag gaatgatgtt ttcaatactg gataccaaca   300
tacaccaagc gttcttttcc ttcgttccgg caacgctctt tccttcttta aggcaacatc   360
ccaaatcctg gaaactggtc ctctaatttt tccaacaaga gcaagtttaa tgttgggcaa   420
aaggtggggc aagaacccat cctcccatct ggggatggat catcagagga ggggcgaaag   480
gcagggcagt atggtatcca ctatcgcaag agtcacacag aagaattagc tcaggatggt   540
ttggaaggcc acatttttttg catggttcat catcatctgc taggatggct tcttcacttt   600
cctttttcttc ctcctcttct gaagctgcag atgatttttc actgccagac ccttcacttt   660
catcattgct ggaatatttc catctgccac gtgtccgaga accagtccat cgaactttgc   720
ctttgggttt taccttgctt actttagaat ttgtatcttt ctctgatttt ttcaaaattt   780
ccttttttgtc agttttttgc aaagctgttg actcttcttc cacctcatct tctccttccc   840
ctctttttttt atcagctttc tgatctctga tctcagccac ttttgcagtg ggtctagata   900
ttcttggaga tcttcttaaa gtacgaccca catttgtttt ctcctcttcc ttttctgtct   960
tctcttgctt gtttttctggt tctagaactt tggggggaga atcgggcttc ttttttccgac  1020
ttgatatcct gattgttaat ttgatgccct ctttctgcct ttcagaggtt atctctgtat  1080
tttctgaggc agtggtttct tcttcaggaa ccaacttata tttgaatttg ctttttttgca  1140
tagaaccctt tgtctcagaa ggctcctcta tgccagaggt ctgggcattg tccagattat  1200
ccatttctac ctttgtgaac tcagaatcct cttttagggt ttctaggtct actttttttca  1260
cagactggcc accaacagta cttgtactct ggcattctac cacttctttt tctgaggcta  1320
gtttctcaca gtggtcaatg atattagatg gtggagaagt ttcagctgcc tcaggagagc  1380
caggcttttc tgactctaga gtactctttg gaacttcttc tggtattgga ctcaatcttt  1440
gtgcgtcctt atcaagaaaa gtcttttttgg acttctctaa cttttcaaga cattctagga  1500
ttggtgggcg cttatccttc ttagttttgg gagacttctc ttcacctttc atggtacacg  1560
actcggtgga agataaagca gttttttgaag agagatcttt tgccatctca gaagaatcaa  1620
gagaagtttc catttctgga ggatcgggtt cctctatttg tgcttttttga ctatggatct  1680
ctaagactga tattgaacta tctgcatctt tcctcaaagg ggctgtttct ttctcaagct  1740
cacctgtttt catacttggt tatgacagaa tttaaggact ctgttccatt tccctccgtg  1800
atgatatttc tgtccttagg ggggctatag ctctcttcct ttgtctcata aaactttgtc  1860
tctacttggt tctgtcttaa aatttggagc tacccttca tcactaactt ctccatttac  1920
ca                                                                1922
```

```
<210> 174
<211> 537
<212> DNA
<213> Homo sapiens
```

```
<400> 174
aaaagcggcg cggctcgttc aagatggcgg agctcgacca gttgcctgac gagagctctt    60
cagcaaaagc ccttgtcagt ttaaaagaag gaagcttatc taacacgtgg aatgaaaagt   120
acagttcttt acagaaaaca cctgtttgga aaggcaggaa tacaagctct gctgtggaaa   180
tgcctttcag aaaattcaaaa cgaagtcgac ttttttctga tgaagatgat aggcaaataa   240
atacaaggtc acctaaaaga aaccagaggg ttgcaatggt tccacagaaa tttacagcaa   300
caatgtcaac accagataag aaagcttcac agaagattgg ttttcgatta cgtaatctgc   360
tcaagcttcc taaagcacat aaatggtgta tatacgagtg gttctattca aatatagata   420
aaccactttt tgaaggtgat aatgactttt gtgtatgtct aaaggaatct tttcctaatt   480
tgaaaacaag aaagttaaca agagtagaat ggggaaaaat tcggcggctt atgggaa     537
```

```
      <210> 175
      <211> 659
      <212> DNA
      <213> Homo sapiens

      <220>
      <221> misc_feature
      <222> (1)...(659)
      <223> n = a,t,c or g



      <400> 175
tctctctttg ccagtaatgt tggaagtgga catttcattg gcctggcagg gtcaggtgct      60
gctacgggca tttctgtatc agcttatgaa cttaatggct tgtttctgt gctgatgttg      120
gcctgggtct tcctacccat ctacattgct ggtcaggtca ccacgatgcc agaataccta    180
cggaagcgct tcggtggcat cagaatcccc atcatcctgg ctgtactcta cctatttatc    240
tacatcttca ccaagatctc ggtagacatg tatgcgggtg ccatcttcat ccagcagtct    300
ttgcacctgg atctgtacct ggccatagtt gggctactgg ccatcactgc tgtatacacg    360
gttgctggtg gcctggctgc tgtgatctac acggatgccc tgcagacgct gatcatgctt    420
ataggagcgc tcaccttgat gggctacagt ttcgccgcgg ttggtgggat ggaaggactg    480
aaggagaagt acttcttggc cctggctagc aaccggagtg agaacagcag ctgcgggctg    540
cccgggaag atgcctttca tattttcga gatccgctga catctgatct cccgtggccg     600
ggggtcctat ttggaatgtc catcccatcc ctctggtact ggngcacgga tcaggtgaa    659



      <210> 176
      <211> 1033
      <212> DNA
      <213> Homo sapiens

      <220>
      <221> misc_feature
      <222> (1)...(1033)
      <223> n = a,t,c or g



      <400> 176
cccacgcgtc cggatgtgtg ctcacacttg ggggacctga ttggggcttc agaccttggg      60
ggcctgtccg cagggtctcc tccatccttc ttgatttgcc tgtcattgag gctgccgct      120
ctgggcgcca ttccccagcc taacacctct tctcagtctt tccttgcagg tccctggagt    180
ccaggccttg gggcagtgaa gaaaccgtgg ggaggggcat gagatgccag tccccaaagt    240
ccttgggagc ccttgtgggc caagtcattg taggacacac cctctcctgg gcattgctga    300
ggtcacccag tgagcctagg ctcccccctc ctcccatccc cagcctgggg gaaccttcag    360
cgtctctcct ccctgtaggc cccggctcag cttcccagga acttttgttg gtgggtacta    420
gtagggtaag gcagttcttc ccatcatgag ggagaccttg ggagactttc attaccaaat    480
ccattgctgc cccgaccttc ctgggactga tctgggtcac cctggtctcc tgatcttgga    540
gaagtcaagt tcttatccca gacttgagag gttacaagcc tccaggtctc tggcaaagtg    600
tggagatgat ggacagccat ttgtacacac accagccagt cccttagcat atctctcttg    660
gttttgtctc aggtctgcct cagccacctc cctgacgctg tcccactgtg tggatgtggt    720
gaaggggctt ctggatttta agaagaggag aggtcactca attgggggag cccctgagca    780
gcgataccag atcatccctg tgtgtgtggc tgcccgactt cctacccggg ctcaggatgt    840
gctgcagcct cctggccact ggaggggctg accgcctgat ccacctctgg aatgttgtgg    900
gaagtcgcct ggaggccaac cagaccctgg agggagctgg tggcagcatc accagtgtgg    960
actttgaccc ctcgggctac caggttttag cagcaactta caaccaggtt gcccagtttt    1020
ggaaggtngg gga                                                          1033
```

```
<210> 177
<211> 335
<212> DNA
<213> Homo sapiens



<400> 177
gtcaaaaacg atttcctagc aactgtggcc gtgatggaaa actgtttctt tggggacaag      60
cacttcatat catcgcaaaa ctcctgggta agtggagaag attgggaatg gtattttttt     120
ccttgttatt aagctattag aaataaatat gcctttgctg gcacataata gtactttggt     180
acaacaggat atcctatgga gtttaaaaat aagtatttaa aatataacaa atctgtatta     240
gtccattctc atgctactaa taaagatata cccaagactg ggtaatttat aaaggaagga     300
gttttaatgg cctcacagtt ccgtcgacgc gggcg                                335




<210> 178
<211> 556
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(556)
<223> n = a,t,c or g




<400> 178
gttcacgtct gcagcagtaa gatgggagct ttgtccacgg agcggctaca gtactacact      60
caggaactgg gggtccggga gcgcagtggc cacagcgtgt ccctcatcga cctctggggc     120
ctccttgttg agtatctcct gtaccaggag gagaaccctg ccaagctgtc tgaccaacag     180
gaggcggtcc gccagggtca gaacccttac cccatttaca ccagtgtcaa cgtccgcacc     240
aacttgagtg gggaagattt tgcagagtgg tgcgagttca cgccctatga ggttggcttc     300
cccaagtacg gggcttatgt tcccaccgag ctcttcggct cagaactctt catgggacga     360
ttgctgcagc tccagcctga accccggatc tgttacctgc aaggtatgtg gggcagcgcc     420
tttgccacca gcctggatga gatcttccta aagaccgccg gctcgggcct cagcttcctg     480
gagtggtaca gaggcagtgt gaatatcaca gacgactgcc agaagcctca gctgcacaac     540
ncctcgacgc gggaat                                                     556




<210> 179
<211> 631
<212> DNA
<213> Homo sapiens
```

```
         <400> 179
         gaatttctgg gtcgtcccac gcgtcccgca aaggatgagg gaaacgatga gggaaaggat      60
         gagggaaagg atgagggaaa ggatgaggga aaggatgagg gaaaggatga gggaaaggat     120
         gagagaaagg atgagggaaa ggatgaggga aaggatgaga gaaaggatga gggaaaggat     180
         gagggaaagg atgagggaaa ggatgaggga aaggatgagg gaaaggatga gggaaaggat     240
         gagggaaagg atgagggaaa cgatgaggga aaggatgagg gaaaggatga gggaaaggat     300
         gagggaaagg atgagggaaa ggatgaggga aaggatgagg gaaacgatga gggaaacgat     360
         gagggaaacg atgagggaaa ggatgaggga aaggatgaga gaaacgatga gggaaaggat     420
         gagggaaagg atgagggaaa ggatgaggga aaggatgaga gaaacgatga gggaaaggat     480
         gagagaaagg atgagggaaa ggatgaggga aaggatgagg gaaaggatga gggaaaggat     540
         gagggaaagg atgagggaaa cgatgaggga aaggatgaga gaaaggatga gggaaaggat     600
         gagggaaagg atgagggaaa ggataagtaa g                                    631
```

```
         <210> 180
         <211> 469
         <212> DNA
         <213> Homo sapiens

         <220>
         <221> misc_feature
         <222> (1)...(469)
         <223> n = a,t,c or g
```

```
         <400> 180
         ggcggggctc ntttgagacc tgatgaccat cattacgccc agcttggcac gaggggagg       60
         acttcagcta cggcctgcag ccctactgcg ggtactcctt ccaggttgtg ggggagatga     120
         tccggaaccg ggaggtgctg ccttgccccg atgactgtcc cgcctgggcg tatgccctca     180
         tgatcgaggg ctggaacgag ttccccagcc ggagggcccg ctttaaggac atccacagcc     240
         ggctccgagc ctggggcaac ctttccaact acaacagctc ggagcagacc tcgggggggca    300
         gaaacaccac gcagaccagc tccctgagca ccagcccact gtgcaatgtg agcaacgccc     360
         cctacgtggg gcccaagcag aaggtcccgc cctttccaca gacccaggtc atccccatga     420
         agggccagat cagacccatg gtgccccgc cgcagctata cgtccccgg                  469
```

```
         <210> 181
         <211> 453
         <212> DNA
         <213> Homo sapiens
```

```
         <400> 181
         caggaattcc gggcgccacc cacgcgttcg atggatcctg gaagagcgca agcgggtgat      60
         gcaggaggcc tgcgccaagt accgggcgag cagcagccgc cgggccgtca cgccccgcca     120
         cgtgtcccgt atcttcgtgg aggaccgcca ccgcgtgctc tactgcgagg tgcccaaggc     180
         cggctgctcc aattggaagc gggtgctcat ggtgctggcc ggcctggcct cgtccactgc     240
         cgacatccag cacaacaccg tccactatgg cagcgctctc aagcgcctgg acaccttcga     300
         ccgccagggt atcttgcacc gtctcagcac ctacaccaag atgctctttg tccgcgagcc     360
         cttcgagagg ctggtgtccg ccttccgcga caagtttgag caccccaaca gctactatca     420
         cccggtcttc tgcatggcca tactggcccg gta                                  453
```

```
<210> 182
<211> 377
<212> DNA
<213> Homo sapiens
```

```
<400> 182
cataatgtat  agtatttctc  ctgccaactc  tgaggaaggc  caggaacttt  atgtctgcac     60
agtcaaggat  gatgtgaact  tggatacagt  acttctccta  cccttttga   aagaaatagc    120
agtaagccaa  ctggatcaac  tgagcccaga  ggaacagttg  ctggtcaagt  gtgctgcaat    180
cattggtcac  tccttccata  tagatttgct  gcagcacctc  ctgcctggct  gggataaaaa    240
taagctactt  caggtcttga  gagctcttgt  ggatatacat  gtgctctgct  ggtctgacaa    300
gagccaagag  cttcctgctg  agcccatatt  aatgccttcc  tctatcgaca  tcattgatgg    360
aaccaaagag  aagaaga                                                       377
```

```
<210> 183
<211> 621
<212> DNA
<213> Homo sapiens
```

```
<400> 183
ctcatcctta  aagtgacaga  gtaaattaac  tctaaggccc  catccaggac  tcaagctgtg     60
tgattttaca  aaaatgaaaa  ttatattaat  aatcccattg  taaaatccca  aaagaaagtc    120
aagagactag  cagaaagaca  ggtgggtgat  gggatgtcct  ggacagagcc  tggatcatga    180
ggtccccatg  tagtgcttgt  actacgcaga  tgtttcctct  tgagctattt  taaaggtgtg    240
gaaaaagcca  aagcaatgcc  ctctccacgg  atactaaaga  ctcacctttc  cactcagctg    300
ctgccaccgt  ctttctggga  aaacaactgc  aaggtaagat  accaacagct  ccctgtgaca    360
gaagggaaag  taagccaacc  aaagcgagtc  ctgcagaccc  caacgcagag  cattcgtgat    420
caccttgcc   tctccactgt  ctctgatgct  taccagcaaa  gagaaaacat  aaagttctac    480
attcagcagg  acattcacct  gaacagtttc  aaataggaca  tgaaggcagg  atccagattg    540
aatgtttgga  gggaactaga  gacatgggga  ggcagtgagt  gcagtaagcg  tagctgtgaa    600
atgaagggga  gaagatggtg  g                                                 621
```

```
<210> 184
<211> 415
<212> DNA
<213> Homo sapiens
```

```
<400> 184
accgggacga  cccacgcgtc  cgggaattta  attctattat  atatgcagac  tttctaaaga     60
```

```
agataaagct tttttatggg agaaacgtta ttattgcttc aaacacccaa attgtcttcc     120
taaaatatta gcaagcgccc caaactggaa atgggttaat cttgccaaaa cttactcatt     180
gcttcaccag tggcctgcat tgtacccact aattgcattg gaacttcttg attcaaagta     240
agtcaaatac atttatttgc tcttgtttta ttgtcagttt ttccagtaag gtatgttgcc     300
agaagtattt cctttccttt taacatgaaa gcaattcaat ataatccaaa tgtgtaaatg     360
tatatttata caaacatatc ttctgcattg aagttgtcaa taaagcattg catgt          415
```

```
            <210> 185
            <211> 359
            <212> DNA
            <213> Homo sapiens
```

```
            <400> 185
ggaaaatgat gatttgaggt ttatttgaaa tacaacaatg tccaatagga aaacactgca      60
actttcttca ggtgttgaga aatccaatag agacctctgc ttgtctcctc ctttggcaag     120
agctccaagg ggagagagag gatgggccac cacgatgaat actacaggct gcggggaagg     180
ataaccctag tccagaccat tcctacaaaa gaaatgggga atccgaaagg aaaaggaaga     240
aatctcacta gcacatgtca aagagccagg agaggcacaa ttcaccaagc agaggaagaa     300
atagtgaccg cagcggggggc cggtgcagcc gcagtgataa cggtcggagc cgttacagg     359
```

```
            <210> 186
            <211> 1616
            <212> DNA
            <213> Homo sapiens
```

```
            <400> 186
ggaggttgcg gcggcggctg cggcgcagcc cggggcggcg ggtgggaaga ggactaccag      60
aggggcctgc gggagaccca gggtcggacc cataggagtc ctgtcgtcag gacctccttg     120
atcggtcttc tgcttgggtt ctcggtgaag gaggagcttc ggggtgtcgg ctgggctgcg     180
cggactcctc ttgggatccg atgatggatc ccacccggtg atcgggaatg gggttacaat     240
gcagtgaggc ggaaaggctc tcgccggggc acagaaagat ccccagggcc gcaaggcgtg     300
ctgtcgcctg caaaggcact gacccacgag cccactgcct ccctccttcc tgggtggagc     360
aggggcctgc cttcatctcc aaggcccggg ggctccggca tctcgacgcg gcttccggcg     420
acacgggcaa agagagacag aggctagtcc gagccggagc cagtgtgacc acacgtggca     480
ctgacgtccc ccaagagcac atgcagtgag cctgtgtctc tgaggccgta gtgggcgacg     540
acgagacgga cagtgatgtc caggcctgcg cccggggggcc actggagacc tgcccctcaa     600
agcggaggaa acgccaagct cacctgaaaa cctgcgagac agggcctgtg cacgagtcca     660
gtactcctac ttcgccaagt ctcagggacc catccccgag caacggtggc ggcgcagaga     720
agagcacggc gccggcgcag gtgcagagag acaggaggct gatggggggga agttgaggca     780
cctggggcag agaaaaaaat gcattgccaa gaggtttctg ggtcatctac tgacgaaaat     840
gtcttcccat cagcccttgc gctggtcccc agggaccctg gcatccgtcg ttggcgccca     900
gggtgcgcgt cgggccacta ggggtacccc aactcggaca gaaggcccat gagttgaatt     960
tgaagtttgt gggaatagag gtgaggcacc aggggcagaa aaaaaacagg agacctcgcc    1020
tcagacaagc gggggcctggg tccccatgg atgaaagtgc cttcccatta tgctgtaccc    1080
tgggcagagt ggacagtgac gaccctggtt cgagcccagg gtgcgcttcg gaccgcttg     1140
cggttaccag aaagcgaaca aatggtccat gagcggaagg tgaggcacct gaggcagaga    1200
aagtaaagaa acgcgccgcc gagaagcagt gcctgggtcc ctcacggagg aaattgtctt    1260
ctccttagcc cgttcgcttg gcagtgaggt ccctggcgtc cctggtttga tcccagggta    1320
```

```
cgcctcgggc cactagtgtt accccaaggt gggcagaaag cccataaggg gaaggcgagg   1380
cacctggggc agagaaaaaa aaaaacttcg ccgcaaagaa gcgcggcctg attccccacg   1440
gacgaaagtg tcttcccatc agtccctgca ctgggacccg gggaccctgg tgtccctggt   1500
tcgagctcag ggtgtgcctc agccgctacg tgcaccccaa ggggagcttt gggagcccaa   1560
aagccaataa gggaaagtaa ttttttaaggc ccccagtggt gaggcccctg tcacag       1616
```

<210> 187
<211> 916
<212> DNA
<213> Homo sapiens

<400> 187
```
ttttgataag aggcaacatg aagcaagaat ccagcaaatg gagaatgaaa ttcactattt    60
gcaagaaaat ctaaaaagta tggaggaaat ccaaggcctt acagatctcc aacttcagga   120
agctgatgaa gagaaggaga gaattctggc ccaactccga gagttagaga aaaagaagaa   180
acttgaagat gccaaatctc aggagcaagt ttttggttta gataaagaac tgaagaaact   240
aaagaaagcc gtggccacct ctgataagct agccacagct gagctcacca ttgccaaaga   300
ccagctgaag tcccttcatg gaactgttat gaaaattaac caggagcgag cagaggagtt   360
gcaggaagca gagaggttca gcagaaaggc agcacaagca gccagagatc tcacccgagc   420
agaagctgag atcgaactcc tgcagaatct cctcaggcag aagggggagc agtttcgact   480
tgagatggag aaaacaggtg taggtactgg agcaaactca caggtcctag aaattgagaa   540
actgaatgag acaatggaac gacaaaggac agagattgca aggctgcaga atgtactata  ·600
cctcactgga agtgacaaca aaggaggctt tgaaaatgtt ttagaagaaa ttgctgaact   660
tcgacgtgaa ggttcttatc agaatgatta cataagcagc atggcagatc ctttcaaaag   720
acgaggctat tggtacttta tgccaccacc accatcatca aaagtttcca gccatagttc   780
ccaggccacc aaggactctg gtgttggcct taagtactca gcctcaactc ctgttagaaa   840
accacgccct gggcagcagg atgggaagga aggcagtcaa cctccccctg cctcaggata   900
ctgggtttat tctccc                                                   916
```

<210> 188
<211> 1080
<212> DNA
<213> Homo sapiens

<400> 188
```
cctctactgc agcttcatca tcagattctt ctttctgttc ttggggtgct tcttcttcct    60
ccatgggctc ctcaacagtt tcagtcttgc tgctccatac ataaatagga agtttatga   120
actgtgaata ttttttgacg agatttttaa ttgtatccaa ttcaaggtaa tcagatgctt   180
cttcttttaa gacaagggta attgtcgttc ccgtcctag agtgtttcct cttgggtcag   240
caattacaga aaattcattg gagtcagact cccagattgg ccagtttggt gtcggtttct   300
attccgcctt ccttgtagca gataaggtta ttgtcacttc aaaacacaac aacgataccc   360
agcacatctg ggagtctgac tccaatgaat tttctgtaat tgctgaccca agaggaaaca   420
ctctaggacg gggaacgaca attacccttg tcttaaaaga agaagcatct gattaccttg   480
aattggatac aattaaaaat ctcgtcaaaa aatattcaca gttcataaac tttcctattt   540
atgtatggag cagcaagact gaaactgttg aggagcccat ggaggaagaa gaagcagcca   600
aagaagagaa agaagaatct gatgatgaag ctgcagtaga ggaagaagaa gaagaaaga   660
aaccaaagac taaaaaagtt gaaaaaactg tctgggactg ggaacttatg aatgatatca   720
aaccaatatg gcagagacca tcaaaagaag tagaagaaga tgaatacaaa gctttctaca   780
```

```
aatcatttttc aaaggaaagt gatgacccca tggcttatat tcactttact gctgaagggg   840
aagttacctt caaatcaatt ttatttgtac ccacatctgc tccacgtggt ctgtttgacg   900
aatatggatc taaaaagagc gattacatta agctctatgt gcgccgtgta ttcatcacag   960
acgacttcca tgatatgatg cctaaatacc tcaattttgt caagggtgtg gtggactcag  1020
atgatctccc cttgaatgtt tcccgcgaga ctcttcagca acataaactg cttaaggtga  1080
```

<210> 189
<211> 1344
<212> DNA
<213> Homo sapiens

<400> 189
```
tttttttttt ttgctgctgg gtcgggtttt atttcaaatg cagccacaga ggcggtttct    60
gcacaggtac gtgatccgac tccacaagct cccaccaggg gctccccatg acccgcaatg   120
acgctgtgtg gggtcaaagg aaaacaggcc acagccaggc ccctcgatgg acgcaggcag   180
gggaccagga atgcggccca cgcagggga tcgggaatca ggcggaaggt gcaggtttgc   240
agctggcggg aggagccagc atgccccaat ctctaaaata ttcccggtag aaaaatagac   300
atttccctcc aaagcagatt cctggggctg gagggtccct ccaaggccag gggtccgggt   360
gattccagag catccacgct ctgcgctgaa ggcactgaac ctgccatcac tgtcacagcc   420
gtcaccggcc aaggagggtc tggaggaggg aaggggccct tgcgaggctc tggtgctggt   480
gatcccggcc cccaccaccg gaggagctga aagcccttgc tcagccgctg ccctgctggt   540
gaacccggcc cccaccgccg gaggagctgc accctgtgtg gtctgaggca gccctgcact   600
gggcagcggc cccgcccccgc gctgaaccca ctaggagagc agctgcagca cctgtcggat   660
gcgctgggcc ctccccggca gggggggatc agagccctcc tcatccagct cccgcatcag   720
ggcttccgcc ttctgcaccg tcagctctcg ggcccggccc tgcagcccct ccaggtaggc   780
cagcagggtg gagaagtgct catcgggaac cttgtcactg tcatacatgt gcagcaggag   840
ccacgtctgc ctcgtcttct gaaacctcca gttcttgtgc ttttgggccc atctgcagag   900
gtagtccagg gccagttcgg cccccgagcg cctggcaggc gggtgctggg ccacaaggcc   960
tgcctcccgc agacgctgcc tctcctcttt cttccgttcc tttttcagct tcctttccag  1020
gaccctctgc tcctctgggg acagctctgg ctctgcgtcc agcccgggcc tgagcacagc  1080
ttcgcccttg gagccggctc cttcgccact tggtgcagcc tcagggccca gcagtggccc  1140
ctctgctgac gccttcttca gcttttttgtt cttttttctct gtcacttcag gaacttttct  1200
cttctgtttt gccatcctgc gcccacctgc gcccacgtcg cccacctaag cgtgaacagc  1260
tgcgtcgcgg acgccgcctt ccggcaggga cccgcggacg cgtgggtcga cccggcaaaa  1320
cgggtccaac ctagggcgtc gagg                                         1344
```

<210> 190
<211> 550
<212> DNA
<213> Homo sapiens

<400> 190
```
cccggaccca cgccgccccc gcgccacggc tctcccccac accgccttat tcgggtcgag    60
accccggggc ccccggcgcc gcctgctgat gagcggatct ccggaccccc cgccagcagc   120
gataggctag ctatcctaga agactatgcg gacccgtttg atgttcagga gactggcgaa   180
ggctcagcag gagcttcagg agccccagag aaggtccctg aaaatgatgg ctacatggag   240
ccctatgagg ctcaaaagat gatggccgag atccggggct ccaaggagac agcaactcag   300
cccttgcctc tgtatgacac accctatgag ccagaggagg atggggccac cccggaaggt   360
```

```
gaggggggccc cctggccccg ggagtcccgc ctgccagagg atgatgagag gcccctgag      420
gagtatgacc agccctggga gtggaagaag gagcggattt ccaaagcctt tgcagttgac      480
attaaggtca tcaaagacct accttggcct ccacctgtgg gacagctgga cagcagcccc      540
tccctgcctg                                                            550
```

```
        <210> 191
        <211> 562
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 191
caattttttt ctcttttctt aaggtatcag atacacaccg gacttcaaca ttctatcata      60
agacctaccc aacccaactg tttacctctg gacaatgcca ccctacctca gaaactgaag     120
gaggttggat attcaacgca tatggtcgga aaatggcact tgggttttta cagaaaagaa     180
tgcatgccca ccagaagagg atttgatacc ttttttggtt cccttttggg aagtggggat     240
tactatacac actacaaatg tgacagtcct gggatgtgtg gctatgactt gtatgaaaac     300
gacaatgctg cctgggacta tgacaatggc atatactcca cacagatgta cactcagaga     360
gtacagcaaa tcttagcttc ccataacccc acaaagccta tattttata tattgcctat     420
caagctgttc attcaccact gcaagctcct ggcaggtatt tcgaacacta ccgatccatt     480
atcaacataa acaggaggag atatgctgcc atgctttcct gcttagatga agcaatcaac     540
aacgtgacat tggctctaaa ag                                              562
```

!

```
        <210> 192
        <211> 2171
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 192
cacgcgtccg gaaaggaaga ggcggtgaga ggctgcaaag cccccttgcgt gttccgcaga      60
aaccagaaag acctcccctt ccacccaagc ctcagttcct aaactcaggg gcatatcctc     120
aaaaacctct tagaaatcag ggagtggtga ggacactgtc cagctctgcc caagaggaca     180
tcatccggtg gtttaaagag gagcagctac cacttcgagc gggctaccag aaaacctcag     240
acaccatagc ccctggttc catggaattc tcacactcaa gaaagcaaat gaacttcttc     300
tgagcacagg catgcccggc agttttctca tccgagtcag tgaaaggatc aaaggctatg     360
ccctgtccta tctgtcggag gacggctgta aacatttcct catcgatgcc tctgcagacg     420
cctacagctt cctgggcgtg gaccagctac agcatgccac cttggcggat ttggtggaat     480
atcacaagga ggaacccatc acttccctgg ggaaggagct ccttctctat ccctgtggtc     540
agcaggacca gctgcctgac tacctggagc tgtttgagtg acagcctcca tcagggtcat     600
cctacagcct ccaagcgggc tttcccctgg acaaatgcca ctgcaacatt tatgtgtgaa     660
gccaaaatca ccctgcagca gagccaatac tgatcaactg aaagtatcca tggagtcctc     720
attgacacct cttttctgca caaatactgg aattcaatgt caagagaaaa tgacctctgc     780
tcaaaaggga gaagagtctc aatttcagca agtaccgtgtc atgaagggta tgaccttaat     840
gatgtacata aaataaaaca aatgaagaaa tggaaaactt ttagaaatta aggtgtactt     900
gaaaacgagt atctatcata tgacccctgc actccctctg tatcatctca ggaggtttca     960
ggggcctgtt gacatgaagt ttcgaagttt catgttggct ttggaatggt agcaaaagcc    1020
tttcctggct gagatgatgc ttaaaacaca cctcacttat tgtacatgtt ggaaccagga    1080
catgagagac atagaaaaac agaagtcatg aatgtaaatt gaatgagagg cttaacatgc    1140
atgaaaatac agatggacct gcaggaaagt gagcaaacat cgctgagttt gttttcttgt    1200
```

83

```
tcgggagaat ggggccgggg ctggcctggc ctcccctgga tatactctat agtgcaccaa   1260
aaggataaag catctgtaca tgtatttttt tattttttat cagaagtgct tagacaagaa   1320
cagaataagc aggctgtttg gatgctactt gtggttgaat tgtgttcccc caaaatatat   1380
ggtgaagtct taacccccat ccccgtgaat gggaccttgt ttggaaatag ggtctttgca   1440
gatatagtca agatgaggtc acattggatt agggtggggcc ccaaatccaa tgactggcat   1500
ccttaggaga agagagagtt ttggtaatag acacaaatgc agtgggaaga agaccagggg   1560
acaagaggca agttggagtg atgcagccgg aagggaaggg acaccaagga tctccggcca   1620
ccagcagaag ccagcagaga ggcatgggac aggttcccca caagccttag aaggaagcat   1680
ggccctgact tcagaattcc agactccaga actggaagaa taaatgtctg ttgttttaag   1740
ctgcttagtt catgctgagt tcatgctgac ttgttactat agccccagaa agctaataca   1800
gtcgtttatg taattacata acctgacaca caagatcgac ccattcactg ctgcccagtc   1860
caccattttc ataatgaagt agaaatggga ggtaagaaaa acattccagc cagttctgtt   1920
tagccctggg acacatattt gtcccgtcag gaatcttatg ccctcctgga accccgccc   1980
acctcagtcc agtcccagtc aggcgaacgg cctctggaca gggactgagg tggctttgag   2040
ccactggaga tcattttct tggaggatgg agattggcta gtacctctgg cctaactgtg   2100
taggtcaata ctcttttaca ttgccttcta ataaaagcag aatgatacag cagtgttgtt   2160
aaaaaaaaaa a                                                        2171
```


```
        <210> 193
        <211> 2095
        <212> DNA
        <213> Homo sapiens




        <400> 193
ggggaagtct ggagaaggca ttgtttcaat tattaaaagt gtgggggcag tgggcggaac     60
aaacgcgccg actacagagg ctggacgtaa gcttatcggt ggcgcgcgtg cgcagcgccg    120
gcccgagttg ccaaaacaaa ggggatttgg tgatggaggc tttgttagaa ggaatacaaa    180
atcgagggca tggtgggga tttttgacat cttgtgaagc agaactacag gagctcatga    240
aacagattga cataatggtg gctcataaaa aatctgaatg ggaaggacgt acacatgctc    300
tagaaacttg cttgaaaatc cgtgaacagg aacttaagag tcttaggagt cagttggatg    360
tgacacataa ggaggttgga atgttgcatc agcaggtaga agaacatgaa aaaatcaagc    420
aagagatgac catggaatat aagcaggagt tgaagaaact acatgaagaa ttatgcatac    480
tgaagagaag ctatgaaaag cttcagaaaa agcaaatgag ggaattcaga ggaaatacca    540
aaaatcacag ggaagatcgg tctgaaattg agaggttaac tgcaaaaata gaggaattcc    600
gtcagaaatc gctggactgg gagaagcaac gcttgattta tcagcaacag gtatcttcac    660
tggaggcaca aaggaaggct ctggctgaac aatcagagat aattcaggct cagcttgtca    720
atcggaaaca gaaattagag tctgtggaac tttctagcca atcagaaatt caacacttaa    780
gcagtaaact ggagcgggct aatgacacta tctgtgccaa tgagttggaa atagagcgcc    840
tcaccatgag ggtcaatgac ttggttggaa ccagtatgac tgtcctacag gagcagcagc    900
aaaaagaaga aaaattgagg gaatctgaaa aactattaga ggctctgcag gaagaaaaga    960
gagaattgaa ggcagctctt cagtctcaag aaaatctcat acatgaggcc agaatacaaa   1020
aggagaagtt acaagaaaaa gtaaaggcaa ctaacactca acatgctgta gaagctataa   1080
gtttggaatc tgtgagtgca acgtgtaaac agctgagcca agaactaatg gaaaaatatg   1140
aagaactgaa gaggatggaa gcacataaca atgaatacaa agcagagatt aagaagttga   1200
aagaacagat tttacagggt gaacaaagtt acagttctgc actagaagga atgaagatgg   1260
aaatctccca tctaactcag gagttacatc agcgagatat cactattgct tccaccaaag   1320
gttcttcctc agacatggaa aagcgactca gagcagagat gcaaaaggca gaagacaaag   1380
cagtagagca taaggagatt ttggatcagc tggagtcact caaattagaa aatcgtcatc   1440
tttctgaaat ggtgatgaaa ttggaattgg gtttacatga gtgttccttg cctgtatctc   1500
cccttggttc aatagctacc agattttggg aagaggagga actgaggtct catcacattc   1560
tagagcgctt ggatgcccat attgaagaac taaaaagaga gagtgaaaag acagtgagac   1620
aattcacagc cttaaagtag cctcttaaaa aaatcacaat cttggaaata aaaataaaca   1680
ccaaagagtt actgtcatct gaagtagcag ctctttaaaa acatgaagag ataaaattat   1740
aaaaatgata catctaaagc agtggtgaag aaagctgaaa aactgatact tttgataggc   1800
attttctctg cactggtttt tttaaaggac ttcttccagc aataagttga aagaataaac   1860
cactttgcta gactttttttc tcatacgaat atttattatc ataaagtgat acttaccttg   1920
```

```
ctgacttaaa tgtgaatagc tatgtactaa ttgaaataag gattttatga tacatgttga    1980
aaataaagta actgcaggaa ctttctttag gggaaatgtg tagaagcatg gatttagggg    2040
tcaaacatac ctggatcgat agactggttt tgccacttac cagccaacgg ggctt         2095
```

```
       <210> 194
       <211> 1051
       <212> DNA
       <213> Homo sapiens
```

```
       <400> 194
gagaccttgt cttaaaaaaa taaaatgctg tcagaataaa aagcagtcaa cagaaatgaa      60
acccttataa gagacaaata aatgtgggca attattttct gcaaaatgcc ctccaagccc     120
ctgggcgcca ttgccttctg taataggaca tcacctgaac aggctttctg ggctggagcc     180
aaggaccctc cctgactccc acctcccttt ctgccttgta ccccagccag gtggaagaga     240
ccggagtggt gctgtccctg gagcaaacgg agcaacactc tcgcagaccc attcagcggg     300
gcgcccccctc tcagaaggac acccctaacc ctggggacag ccttgacacc cctggccccc   · 360
ggatccttgc cttcctgcac ccgccttccc tgagcgaggc tgccctggcc gctgaccccc     420
gccgtttctg cagccctgac ctccgtcgcc tcctgggacc catcctggat ggggcttcag     480
tagcagccac tcccagcacc ccgctggcca cacggcaccc ccaaagtcct ctttcggctg     540
atctcccaga tgaactacct gtgggcaccg agaatgtgca cagactcttc acctccggga     600
aagacactga ggcagtggag acagatttag atatagctca ggatgctgat gctctggatt     660
tggagatgct ggccccctac atctccatgg atgatgactt ccagctcaac gccagcgagc     720
agctacccag ggcctaccac agacctctgg gggctgtccc ccggccccgt gctcggagct     780
tccatggcct gtcacctcca gcccttgagc cctccctgct acccgctggg gggagtgacc     840
cccggctgag ctgctccagc ccttccagag gggacccctc agcatcctct cccatggctg     900
gggctcggaa gaggaccctg gcccagagct caaaggacga ggacgaggga gtggagctgc     960
tgggagtgag acctcccaaa aggtccccca gcccagaaca cgaaaacttt ctgctctttc    1020
ctctcagcct gagtttcctt ctgacaggag g                                   1051
```

```
       <210> 195
       <211> 423
       <212> DNA
       <213> Homo sapiens
```

```
       <400> 195
gtgaactcca agactgtttt gatgttcatg atgcatcttg ggaagagcag atattctggg      60
gatggcataa tgatgtccac atatttgaca caaagacaca gacttggttt caaccagaaa     120
ttaaaggtgg agttccacca cagccacgag ccgcgcatac gtgtgcagtt cttggaaata     180
agggttatat ctttggcgga cgtgttctgc aaactaggat gaatgatttg cactatctaa     240
acctagacac ctggacttgg tctggaagga ttactattaa tggagaaagc ccaaaacatc     300
ggtcatggca tactttaaca cctatagctg atgataaact tttcctatgt ggtggactaa     360
atgcatataa tatgccatta agtgatggtt ggattcataa tgtcacaaca cattgttgga     420
aac                                                                   423
```

```
<210> 196
<211> 411
<212> DNA
<213> Homo sapiens



<400> 196
tttttttttt ttgaggacaa ggtctcactc tgtcacccca aggtgggagt gcagtgacga      60
catcacagct cactggcagc ctcaaccctg gggttcaagt gatcctctca ccttcagcct     120
ccccaagtag ttgtgcctcc taggcacaca acactatgcc ccggcaaatt ttttgtatt      180
ttgtattttt tgtagaaaca ggatttcgcc atgttggcca ggctggtctc gaacaccctg     240
ggctcaactg atccgcctgc ctcggcctcc caaagtgctg ggattacagg tgtgagccac     300
cctgctcaac caggttttat tatttaagtt agttaaactt tggatagatt gtataatata     360
tagtttaatg taatcatgct catatttttt aaataaataa aacactatac t              411



<210> 197
<211> 751
<212> DNA
<213> Homo sapiens



<400> 197
cccacgggaa gggcaggtga agcaggggct gctgggggat tgctggttcc tgtgtgcctg      60
cgccgcgctg cagaagagca ggcacctcct ggaccaggtc attcctccgg acagccgag      120
ctgggccgac caggagtacc ggggctcctt cacctgtcgc atttggcagt ttggacgctg     180
ggtggaggtg accacagatg accgcctgcc gtgccttgca gggagactct gtttctcccg     240
ctgccagagg gaggatgtgt tctggctccc cttactggaa aaggtctacg ccaaggtcca     300
tgggtcctac gagcacctgt gggccgggca ggtggcggat gccctggtgg acctgaccgg     360
cggcctggca gaaagatgga acctgaaggg cgtagcagga agcggaggcc agcaggacag     420
gccaggccgc tgggagcaca ggacttgtcg gcagctgctc cacctgaagg accagtgtct     480
gatcagctgc tgcgtgctca gccccagagc aggtgaggca cgtggccagc atgggagggc     540
tgcagccagc gtgcccccca ctgccaggcc tcaggcacac tgtagctttt tatgtgactg     600
gctacacagc cctgtcagga ctaagtggga agaagtaagc ttgttctcaa gggtggtgtc     660
ctcagtttgt gaccttcccc tgctgtcctc ttccagaggg acgtggccct tctctcccct     720
gaccagtcct ttccactagt gcgaggcagg g                                    751



<210> 198
<211> 636
<212> DNA
<213> Homo sapiens



<400> 198
gggccgagtg tctggaggcc tctattgccc gatatgccca ccgtgtcgcc aatagccgtt      60
atacctttga cggtgaaacc gtgacgcttt cgccaagtca gggcgttaac cagctgcacg     120
gcgggccgga agggttcgac aaacgtcgct ggcagattgt gaaccagaac gatcgtcagg     180
tgctgtttgc cctgagttca gatgatggtg atcagggctt cccgggtaat ctcggcgcga     240
```

```
cggtgcaata  tcgtctgacc  gacgataacc  gtatctccat  tacttatcgc  gccacagttg  300
ataaaccttg  cccggtgaat  atgactaatc  acgtctattt  caatcttgac  ggcgagcagt  360
ctgacgtgcg  caatcacaag  ttgcagattc  tggcggacga  atatctgccg  gttgatgaag  420
gcggcattcc  gcacgacggc  ctgaaatctg  tcgccggaac  gtctttgat   ttccgcagcg  480
ccaaaatcat  cgccagtgag  tttcttgccg  acgacgatca  gcgcaaagtg  aaaggttacg  540
atcacgcatt  cttgttacag  gccaaaggcg  atggcaagaa  agtggcggcg  catgtctggt  600
cagcagatga  aaaattgcag  ctgaaggtct  acacca                  636
```


        <210> 199
        <211> 690
        <212> DNA
        <213> Homo sapiens

        <400> 199
```
aaagtggcag  tgtttcttct  gaaattctca  ggcagtcaga  ctgtcttagg  caaatcttga   60
taaaatagcc  cttatccagg  tttttatcta  aggaatccca  agaagactgg  ggaatggaga  120
gacagtcaag  ggttatgtca  gaaaaggatg  agtatcagtt  tcaacatcag  ggagcggtgg  180
agctgcttgt  cttcaatttt  ttgctcatcc  ttaccatttt  gacaatctgg  ttatttaaaa  240
atcatcgatt  ccgcttcttg  catgaaactg  gaggagcaat  ggtgtatgac  aagccgccga  300
aatttgccat  gtcacgagag  caaatgtcac  agtcatgttc  tcacacggca  cataatgcaa  360
gtctgttgac  agatgcgggt  ccattgtcat  gtggggagtc  gagggcgagc  tgtttgtttt  420
tgtaacgatg  ttgggaagtg  atggctctgc  agtcacaaag  agcagccttc  tctcactggc  480
tgcaccgatg  aacattacga  agttctagaa  caaacatcac  ttcaaaatgc  ctggagtaat  540
tcctcttata  tcaactaatt  tcaagaagaa  aacctgcaga  aactaacccc  acccctctca  600
acgagaatat  tgtgtccacg  tcctctttac  ttatacgacc  cgtctcttat  tctcttataa  660
cacaacgtca  taactaaacg  agcacaacac                                    690
```


        <210> 200
        <211> 433
        <212> DNA
        <213> Homo sapiens

        <400> 200
```
gtgactccaa  ggaaccaaga  ctgcagcagc  tgggcctcct  ggaggaggaa  cagctgagag   60
gccttggatt  ccgacagact  cgaggataca  agagcttagc  agggtgtctt  ggccatggtc  120
ccctggtgct  gcaactcctc  tccttcacgc  tcttggctgg  gctccttgtc  caagtgtcca  180
aggtccccag  ctccataagt  caggaacaat  ccaggcaaga  cgcgatctac  cagaacctga  240
cccagcttaa  agctgcagtg  ggtgagctct  cagagaaatc  caagctgcag  gagatctacc  300
aggagctgac  ccagctgaag  gctgcagtgg  gtgagcttcc  agagaaatct  aagctgcagg  360
agatctacca  ggagctgacc  tggctgaagg  ctgcagtggg  tgagcttcca  gagaaatcta  420
agatgcagga  gag                                                       433
```


        <210> 201
        <211> 782
```

```
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(782)
<223> n = a,t,c or g




    <400> 201
gaagaagggg aaaagaggct ccaggcccct tctccaatca ctccctgcca ccctttctcc     60
tttggattcc ttggctgctt tagcaggtct tcctagaggc taactttgat ctttcttgct    120
gcagtttctt tttgggagag ctagtcagtc ccacagagtg gtatccctag aagggagaag    180
taaggattgc cctcttcttt aaaatgaaag ccagctattt ttcacgccct ttaactgcag    240
gtctgctcta ttttcttttc tctctctgga gctgagagtc agagggccct tctcctcctc    300
ctttcagccc ccaacactaa gctgatggat tgataaatac ctcagcccct cgcctttctc    360
aacccacctg gcaagtcttc ttaggatctg atcccagttt tctggaagca atcctacccc    420
agcccattct tcccagagtc gagccttaat ccttctcact tctcagtgtc agagcagaaa    480
tgaatcctgg ggttgactgt gtccattcgg gttattagca gctaagaagc ccagacgagt    540
agtgtgagct gccttgggag cctcagtgag ggcactggga ctggcctcac tctcttgccc    600
ccagcctagt gggctttctc ctctgtctct ccggtggccc caggcaatcg actgcatcac    660
gcanggacgt gagttggagc ggccacgtgc ctgcccacca gaggtctacg ccatcatgcc    720
gggctgctgg gcagcggagc cccagcaacg ccacagcatc aaggatgtgc acgcccgctg    780
ca                                                                    782




    <210> 202
    <211> 714
    <212> DNA
    <213> Homo sapiens




    <400> 202
ttcgagaccc tatccatgag gggaattcct cacatgctgg ctttggggcc acagcagctg     60
ctggcccagg atgaggaggg ggacacgctc cttcacctgt ttgcggctcg ggggctgcgc    120
tgggcggcat atgctgcggc tgaggtgctc caggtgtacc ggcgtcttga cattcgtgag    180
cataagggca agacccctct cctggtggcg gctgctgcca accagcccct gattgtggag    240
gatctgttga acctgggagc agagcccaat gccgctgacc atcagggacg ttcggtcttg    300
cacgtggccg ctacctacgg gctcccagga gttctcttgg ctgtgcttaa ctctggggtc    360
caggttgacc tggaagccag agacttcgag ggcctcaccc cgctccacac ggccatcctg    420
gcccttaacg ttgctatgcg cccttccgac ctctgtcccc gggtgctgag cacacaggcc    480
cgagacaggc tggattgtgt ccacatgttg ctgcaaatgg gtgctaatca caccatccag    540
gtgagcgggg atgtgggcgg tcagaccctg ggagattgtg tggaatgggg ccacttggat    600
gtccgggagc tccaggcaaa tgctgacttt gcctcttcct tgctgcgtgc ccttgaacat    660
gttacttcac ttctctgtgc cttaagggtt ttttgcttgt ttctttgtca gtta          714




    <210> 203
    <211> 477
    <212> DNA
    <213> Homo sapiens
```

```
<400> 203
cggacgcgtg ggcggacgcg tgggtggggga ccaagatggc ggaccttgat tcgcctccga    60
agctgtcagg ggtgcagcag ccgtctgagg gggtgggagg tggccgctgc tccgaaatct   120
ccgctgagct cattcgctcc ctgacagagc tgcaggagct ggaggctgta tacgaacggc   180
tctgcggcga ggagaaagtg gtggagagag agctggatgc tcttttggaa cagcaaaaca   240
ccattgaaag taagatggtc actctccacc gaatgggtcc taatctgcag ctgattgagg   300
gagatgcaaa gcagctggct ggaatgatca cctttacctg caacctggct gagaatgtgt   360
ccagcaaagt tcgtcagctt gacctggcca agaaccgcct ctatcaggcc attcagagag   420
ctgatgacat cttggacctg aagttctgca tggatggagt tcagactgct ttgagga      477



<210> 204
<211> 706
<212> DNA
<213> Homo sapiens



<400> 204
gcggtggaat tccgggttcc ccgttctggt tcggcatatc tctacagcta tgtcactgtg    60
ggtgaactct gggccttcac cactggctgg aacctcatcc tctcctatgt cattggtaca   120
gccagtgtgg cccgggcctg gagctctgct tttgacaacc tgattgggaa ccacatctct   180
aagactctgc aggggtccat tgcactgcac gtgccccatg tccttgcaga atatccagat   240
ttctttgctt tgggcctcgt gttgctgctc actggattgt tggctctcgg ggctagtgag   300
tcggccctgg ttaccaaagt gttcacaggc gtgaaccttt tggttcttgg gttcgtcatg   360
atctctggct tcgttaaggg ggacgtgcac aactggaagc tcacagaaga ggactacgaa   420
ttggccatgg ctgaactcaa tgacacctat agcttgggtc ctctgggctc tggaggattt   480
gtgcctttcg cttcgaggg aattctccgt ggagcagcga cctgtttcta tgcatttgtt    540
ggtttcgact gtattgctac cactggagaa gaagcccaga atccccagcg ttccatcccg   600
atgggcattg ggatctcact gtctgtctgc tttttggcgg attttgctgt ctcttctgca   660
ctcaccctga tgatgcctta ctaccagctt cagcctgaga gccctg                  706



<210> 205
<211> 852
<212> DNA
<213> Homo sapiens



<400> 205
ggcttccatc ctaatacgac tcactatagg gctcgagcgg ccgcccgggc aggtgctggg    60
tcgtttgtgg gcgaagtaag tgctgtagat aaagactttg ggccaaatgg agaagtaagg   120
tattcttttg aaatggtgca gccagatttt gagttgcatg ccatcagtgg ggaaattaca   180
aatactcatc agtttgacag ggagtctctt atgaggcgga gagggactgc tgtgtttagc   240
tttacagtca tagcaacaga tcaggggatc cctcagcctc tcaaggatca ggccactgta   300
catgtttaca tgaaggatat aaatgataat gctcccaaat ttttaaaaga cttttaccaa   360
gctacaatat cagaatcagc agccaatctg acacaagtgt taagagtatc tgcctcagat   420
gttgatgaag gtaataatgg acttattcac tattctataa taaaaggaaa tgaagaaaga   480.
cagtttgcta tagacagtac ctctggtcag gtaacactaa ttggcaaatt agactatgaa   540
```

```
gcaacacctg cctattccct tgtaattcaa gcagtggatt cagggacaat ccccctcaat    600
tcaacgtgta ctttaaatat tgatatttta gatgaaaatg acaatacccc tttctttccc    660
taaatcaaca cttctttgtt gatgttttgg aaaacatgag aattggtgaa ctcggggcct    720
ctggtactgc aactgattcc cgattcaggt gacattgctg atttatatta caagtttact    780
gggactaaac acccccccgg aactttttagc attagcccca aacacttggg agtattttttc   840
ttggcccaaa aa                                                        852
```

```
          <210> 206
          <211> 361
          <212> DNA
          <213> Homo sapiens
```

```
          <400> 206
ctggtgattg ctatgacctg tatggagggg agaagtttgc cactttggct gagttggtcc    60
agtattacat ggaacatcat gggcaattaa aagagaagaa tggagatgtt attgagctta    120
aaaatcctct gaactgtgca gatcctactt ctcaaaggtg gtttcatgga cacctctctg    180
gaaaagaagc agagaaattg ttaactgaaa aaggaaagca tagtagcttt cttgtacgag    240
agagccagag ccaccctgga gattttgttc tctccgtgtg caccggtgat gacaaaggag    300
agagcaatga cggcaagtct aaagtgactc atgtcatgat tcactgtcag gaactgaaat    360
c                                                                    361
```

```
          <210> 207
          <211> 2483
          <212> DNA
          <213> Homo sapiens
```

```
          <400> 207
ataaaatgga catagtagta ggacttacct cccagggctg tggttataga ggttttgtaa    60
gaattaaatg acatcatcca tgtaaagcat atagcagaat gcctggcaca tagatgccct    120
tagtgaattt ttgctgttgt tgtgattctt ttgggagcag tcatagtaac atattctcat    180
atgttggtat gttcttttcat attgcattgt cttatgaata gattctggaa accaaaatgg    240
aggaaatgat gataagacta agaatgctga gaggaactat ttaaatgttt tacctgggga    300
attttatatt acacggcatt ctaatctctc agaaatccat gttgctttcc atctctgtgt    360
ggatgaccat gtgaaatcgg gaaacatcac tgctcgtgat cctgccatta tgggactccg    420
aaatatactc aaagtttgct gtacccatga catcacaaca ataagcattc ctctcttgct    480
ggtacatgat atgtcagagg aaatgactat accctggtgc ttaaggagag cggaacttgt    540
gttcaagtgt gtcaaaggtt tcatgatgga aatggcttca tgggatggag gaatttctag    600
gacagtgcaa tttctagtac cacagagtat ttctgaagaa atgtttttatc aacttagtaa    660
catgcttccc cagatcttcc gagtatcatc aacactcact ctgacatcca agcactaaac    720
ccttatagat tgacatgctg gcagaagatg attgttaaac tctccaggaa cttgtgctat    780
gctgggaatc tgtcaagcaa aagatgccca gaaagagaac ttgcagctca atccacaaat    840
caagatacat gtgtgtgaaa cccattccaa aaatttatat actggcacaa actggtggat    900
caacccctaa cttaaacact taaagtctct ttatgaattt ctcttttttt cttctctgtg    960
ttacctgtgg aatattaggt aatctaaaac tttttatttta ttcacacagg gacacttggg   1020
gggaaaggga aacttgatta tatttacatg ggagggcatt tgactttttt caaggagggc   1080
ttggacttcg tcttcaggt gcaatcctta attaaacata caaacaaaat tttcctttta   1140
ctttctttgc caaaacaaaa tgtaaaagca ctgaaatata cattgcaagt acaaattttcc   1200
tgtgaaaatc tttttataga aacacaaatg tataagacaa atgtgcttgt tctttttaaat  1260
```

```
tctcctgttt cagaatctct ttttaatcta ctcctaagga tgtacaagtt agagtcagaa   1320
gacgttttgg attttttccc tctctctcat cctcccgctg tgcccttgca cttgcatatt   1380
aataacattt catggactgg gaaatagtgt tcttttttgc aagcttgatg tcaagttagt   1440
ctaaaccagc acctggcagt attttagtgc tcatcaacat tgtgacaatc acacaaggaa   1500
gatcatttct acatttctgt cctccctgcg ttctcagctt gcttaaccat tcctctacct   1560
cttgcatttt tttgcggata aatgtatccc catttctgct tctctgtttc ccctcctttt   1620
ccattgtttt tccttatggt actactttct caggtgctac atatcatata tttgtcccat   1680
ctataacata tttaaatgct ataagtagta actccattaa acaaaggcat ttacaaaagc   1740
acacaggtgt ttagaaaagc aatagtttca tcaattccaa gttatgtgga tattgtaact   1800
ggccacaaga atgaaatgga gggcatttgg tgtcataaga tggcatgtct tgatgacaag   1860
aaacaaaacg cccttcatta atatgcctca gtgtaataac tattatagaa actgttggca   1920
agcagagtgc tttcctataa cagaatgtgt cttaattttc tacttgaggg aaaggtttgt   1980
ccaggtaaca acactaaaga caaccctaag aacacccact ccagcagtat gtccattaga   2040
cactaaaact ctccaaatta tttgtcaggg agcctggcga ttctgccaag aaggcaggtg   2100
ttttgccctt agagcctata cagttctctt ggagaaattg tctttcaggc accactgtta   2160
atcactgaga ctgattctaa tgcaaagcag ggaagacaga ggcagaaacc aggagagtgg   2220
tagatcagtg cagcccagat atcggaatgg aggagcaaag tttcattcac ggatgtttgt   2280
tgaatgctgc tgcccaactc ttcctttgtc acctctaggc tattccacta agttacttat   2340
aaactggtgg ctttaactga gggctgtgta aaggtactat ttggcatgtg aagtcaggat   2400
aaatttatcg aatgtccgtt ttccacatgc aactgtgtta cagaagtagt aaaattggaa   2460
gaatcatgtt tatggtgtta cca                                           2483
```

```
        <210> 208
        <211> 366
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 208
caagcatcct gcccgccctg ctggtgacca tcctgatctt catggaccag cagatcactg     60
ccgtcattgt caaccggaag gagaacaaac tgaagaaggc tgccggctac catctggacc    120
tgttctgggt gggcatcctc atggctttgt gctcctttat ggggctcccc tggtacgtgg    180
ctgccacggt catctcgatc gcccacatcg acagcctcaa gatggagaca gagaccagtg    240
cccctgggga gcagccccag tttctgggag tcaggaaca gagagtaacc ggcatcatcg    300
tcttcatcct gacgggaatc tctgtcttcc tggctcccat cctaaagtgt atccccctgc    360
cggtgc                                                              366
```

```
        <210> 209
        <211> 574
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 209
cggcgcttca cgcgtagagg caggcagtgc gaatggaatg ctcattgatg gtggtagcca     60
gatagtaaaa gttcaagggc acgctgatgg tacaacgata aataagtctg gctctcagga    120
cgtagtacaa ggaagtctgg caacgaacac aaccataaat ggtggtcgcc agtatgttga    180
acagagcaca gtagaaacaa caaccattaa aaatggcggt gagcaaagag tatatgagag    240
ccgtgcgctg gacacgacga ttgaaggcgg aactcagtct ctgaatagta agtcaacggc    300
aaaaaaatacg catatctatt ctggtggcac gcaaattgtt gataacacca gcacctcgga    360
```

91

```
tgttattgaa gtttattctg gtggcgtgct tgatgttagg ggtggtacgg caacaaatgt    420
tacccagcac gatggtgcaa tttttaaaaac taacactaac ggtacgacgg tgagcggtac   480
gaatagtgaa ggtgcattct ccatccacaa tcacgtggca gacaatgtgt tgctggaaaa    540
cggtggtcat ttagacataa acgcatatgg ttcg                                574
```

```
<210> 210
<211> 383
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = a,t,c or g
```

```
<400> 210
tttttctctt ccatccagct gactgatgat cagggccccg tcctgatgac cactgtagcc    60
atgcctgtgt ttagtaagca gaacgaaacc agatcgaagg gcattcttct gggagtggtt   120
ggcacagatg tcccagtgaa agaacttctg aagaccatcc ccaaatacaa ggtaatgaat    180
gacctaatcc ctgaaatcaa agcaacagag atgcccagag ccttgttttc acaaagttca    240
ggcttcaaac tctactttgg agcgatgttt ttgctcacca ctattacagc ctgttagctt    300
gtctttatac catctgcaca gttatttaaa aggnnnnnnn nnnattattt acaaggactg    360
gctgtttttc ttatttacct cct                                            383
```

```
<210> 211
<211> 592
<212> DNA
<213> Homo sapiens
```

```
<400> 211
tttcgtgttc aggaactggc accaatgcgt gttacatgga ggacatgagc aacattgacc    60
tggtggaggg cgacgagggc aggatgtgca tcaacacaga gtggggggcc ttcggggacg   120
acggggccct ggaggacatt cgcactgagt tcgacaggga gctggacctc ggctctctca    180
acccaggaaa gcaactgttc gagaagatga tcagtggcct gtacctgggg gagcttgtca    240
ggcttatctt gctgaagatg gccaaggctg gcctcctgtt tggtggtgag aaatcttctg    300
ctctccacac taagggcaag atcgaaacac ggcacgtggc tgccatggag aagtataaag    360
aaggccttgc taatacaaga gagatcctgg tggacctggg tctggaaccg tctgaggctg    420
actgcattgc cgtccagcat gtctgtacca tcgtctcctt ccgctcggcc aatctctgtg    480
cagcagctct ggcggccatc ctgacacgcc tccgggagaa caagaaggtg gaacggctcc    540
ggaccacagt gggcatggac ggcaccctct acaagataca ccctcagtac cc            592
```

```
<210> 212
<211> 2166
<212> DNA
```

<213> Homo sapiens

<400> 212
tttcgttgca attgcaacga atggtgttgt gcctgctggt ggctcctact acatgatttc   60
caggtctctg ggcccagagt ttggggggtgc cgtgggcctc tgcttctacc tgggcactac   120
ctttgcagga gccatgtaca tcctgggcac catcgaaatc ctgctggctt acctcttccc   180
agccatggcc atcttcaagg cagaagatgc cagtggggag gcagcagcca tgctgaacaa   240
catgcgtgtt tacggcacct gtgtgctcac ctgcatggcc actgtggtgt ttgtgggtgt   300
caagtatgtc aacaagtttg cccttgtctt cctgggttgt gtcatcctct ccatcctggc   360
catctatgct ggggtcatca agtctgcctt cgacccaccc aacttcccga tctgcctcct   420
gggtaaccgc acgctgtctc gccatggctt tgatgtctgt gccaagctgg cttgggaagg   480
aaatgagacg gtgaccacac ggctatgggg ccttttctgc tcctctcgct tcctcaacgc   540
cacctgtgat gaatacttca cccgaaacaa tgtcacagag atccagggca tccctggtgc   600
tgccagtggc ctcatcaaag agaacctctg gagctcctac ctgaccaagg gcgtgattgt   660
ggagaggagt gggatgacct cggtgggcct ggccgatggc actcctatcg acatggacca   720
cccttatgtc ttcagtgata tgacctccta cttcaccctg ctggttggca tctacttccc   780
ctcagtcaca gggatcatgg ctggttctaa ccgctctggg gacctgaggg atgcccagaa   840
gtcaatcccc actggcacca tcctggccat cgccaccacc tctgctgtct acatcagctc   900
cgttgttctg tttggggcct gcattgaggg ggtcgtcctg cgggacaagt ttggcgaagc   960
tgtgaatggc aacctcgtgg tgggcactct ggcctggcca tctccatggg taattgtcat 1020
cggatccttc ttctccacct gtggggctgg gctgcagagc ctcacggggg ccccacgcct 1080
gctgcaggcc atctcgaggg atggcattgt gcccttcctg caggtctttg gccatggcaa 1140
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cctcattgca tccctcgacg aggtggcccc catcctctct atgttcttcc tgatgtgcta 1260
catgtttgtg aatctggcct gtgcagtgca gacgctgctg aggacaccca actggaggcc 1320
acgctttcga tattaccact ggaccctctc cttcctgggc atgagcctct gcctggccct 1380
catgttcatc tgctcctggt attatgcact ggtagccatg ctcattgctg gactcatcta 1440
caagtacatt gagtaccgtg gggcaaagaa ggagtggggc gatgggatac gaggtctgtc 1500
tctcagtgcg gctcgctatg ccctcttacg cctggaggaa gggcccccac acaccaagaa 1560
ctggaggcca cagctgctgg tgctggtgcg tgtggaccaa gaccagaatg tggtgcaccc 1620
ccagctgctc tcactgacct cccagctgaa ggcagggaag ggcctgacca tcgtgggctc 1680
tgtccttgag ggcacctttc tggaaaatca tccacaggcc cagcgggcag aagagtctat 1740
caggcgcctg atggaggcag agaaggtgaa gggcttctgc caggtggtga tctcctccaa 1800
cttgcgtgat ggcgtgtccc atctgatcca gtctgggggc ctcgggggggc tgcagcacaa 1860
cactgtgctt gttggctggc cccgcaactg cgccagaag gaagatcatc agacgtggag 1920
gaacttcatt gagctggtcc gggaaaccac agctggccac ttagccctgc tggtcaccaa 1980
gaacgtttcc atgtttcctg ggaaccctga gcgcttctct gaaggcagca tcgaccgttg 2040
ggggattggg cacgatggag gcatgctcat gctggtgccc ttcctgctgc ggcaccacaa 2100
ggtctggcgg aagtgcaaga tgcgtatctt cactgtggcc cagatggttg acatgcatgc 2160
catgag   2166

<210> 213
<211> 392
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(392)
<223> n = a,t,c or g

<400> 213

```
ttctatctga ggctactgtc ttttttctgc tttcaggagc atgagaagag gtgttggagc      60
gttgacttta atttgatgga tcctaaactc ttggcttcag gttctgatga tgcaaaaggt     120
actgtttgaa tctctttctc agcacctcct tctccctggc cctcttaact gtaattcctt     180
tcatcggcag aaatacaaat atttactcaa actcatgtca gtcctttgtg attactgatt     240
attattattc cccannnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn      300
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn      360
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nn                                   392
```

```
<210> 214
<211> 425
<212> DNA
<213> Homo sapiens
```

```
<400> 214
ggcggaattc aaaagcaatg cacaggtctt cctgtgacgg gccgctactc tctctgccct      60
cagtgggacg gtcagccacc catgccctgg tccaggccca gctgatctgc tcaggagcca     120
ggcggggcat gcacgctttt attgtgccaa tccggagtct tcaggaccac accccactgc     180
caggtaagcc cataatgctc cctcaaggaa ccctgccagg aggagagccc aggtggcctc     240
cctgacctgg ggccccagag ggccacagga gtagctaaga catgtctccc ttgggcaggg     300
agcggtccag ttggacagac ttggtgctaa ctggctaggt gaacttgagc aagatttagc     360
atctttctga cctcagcttg ttcacctgca aaataggtac aataatccca gtgtcacagg     420
ctgct                                                                425
```

```
<210> 215
<211> 608
<212> DNA
<213> Homo sapiens
```

```
<400> 215
ctgcgggacc ctcatcttgc aggcccgggc ctatgtggga ccgcacgtcc tggcagtggt      60
gacccgcaca gggttctgca cggcaaaagg gggcctggtg agctccatct tgcacccccg     120
gcccatcaac ttcaagttct ataaacacag catgaagttt gtggctgccc tctctgtcct     180
ggctctcctc ggcaccatct acagcatctt catcctctac cgaaaccggg tgcctctgaa     240
tgagattgta atccgggctc tcgacctggt gaccgtggtg gtgccacctg ccctgcctgc     300
tgccatgact gtgtgcacgc tctacgccca gagccgactg cggagacagg gcattttctg     360
catccaccca ctgcgcatca acctgggggg caagctgcag ctggtgtgtt tcgacaagac     420
gggcaccctc actgaggacg gcttagacgt gatgggggtg gtgccctga aggggcaggc      480
attcctgccc ctggtcccag agcctcgccg cctgcctgtg gggcccctgc tccgagcact     540
ggccacctgc catgccctca gccggctcca ggacaccccc gtgggcgacc ccatggactt     600
gaagatgt                                                             608
```

```
<210> 216
<211> 858
<212> DNA
```

<213> Homo sapiens

```
        <400> 216
ctatctggtc actggccact gtggctttgt attcctctaa cgtggctgcc aaggctgctt        60
ttcctttctg ctcagactca ataattcgct ccatatggtg actgcgttct ttgagtgccc       120
ctatcatttc ttgagcttcc ttattgtctt gttctgccat tttcaaagta ttgcttaaat       180
gctgctggac accaagaagc tgctcccgtt caaaacgggc attctcagcg aggtccatgt       240
aacgttgctc taattccata tagcgcccac tttttacatc ttcatctatg acagattgaa       300
tacttccgct ctcttctaga tgagcatcac atttcttatg tcatagatga agatgtaaaa       360
agtgggcgct atatggaatt agagcaacgt tacatggacc tcgctgagaa tgcccgtttt       420
gaacgggagc agcttcttgg tgtccagcag catttaagca atactttgaa aatggcagaa       480
caagacaata aggaagctca agaaatgata ggggcactca agaacgcag tcaccatatg        540
gagcgaatta ttgagtctga gcagaaagga aaagcagcct ggcagccac gttagaggaa        600
tacaaagcca cagtggccag tgaccagata gagatgaatc gcctgaaggc tcagctggag       660
aatgaaaagc agaaagtggc agagctgtat tctatccata actctggaga caaatctgat       720
attcaggacc tcctggagag tgtcaggctg gacaaagaaa agcagagac tttggctagt        780
agcttgcagg aagatctggc tcatacccga aatgatgcca atcgattaca ggatgccatt       840
gctaaaggta gaggatga                                                     858
```

<210> 217
<211> 399
<212> DNA
<213> Homo sapiens

```
        <400> 217
agcacgctac cgctttaccc tcagcgccag gacgcaggtg ggctctgggg aagccgtcac        60
agaggagtca ccagcacccc cgaatgaagc tactccaacc gcagctcctc ccacattgcc       120
cccgactacc gtgggtgcga cgggcgctgt gagcagtacc gatgctactg ccattgctgc       180
caccaccgaa gccacaacag tccccatcat cccaactgtc gcacctacca ccatggccac       240
caccaccacc gtcgccacaa ctactacaac cactgctgcc gccaccacca ccacggagag       300
tcctcccacc accacctccg ggactaagat acacgaatcc gcccctgatg agcagtccat       360
atggaacgtc acggtgctcc ccaacagtaa atgggccaa                              399
```

<210> 218
<211> 662
<212> DNA
<213> Homo sapiens

```
        <400> 218
ctgaagtcaa cgcaagacga aatcaaccag gcaaggagca aactgtccca gctgcatgaa        60
agccgccagg aggcccacag gagcctggag cagtatgacc aggtgctcga tggagcccat       120
ggtgccagcc tgaccgacct ggccaacctg agcgaaggcg tctccctggc agagagggggc       180
agttttggag ccatggatga tcctttcaaa aataaagcct tgttatttag caacaacacg       240
caagagttgc atccggatcc tttccagaca gaagacccct tcaaatctga cccatttaaa       300
```

```
ggagctgacc ccttcaaagg cgacccgttc cagaatgacc cctttgcaga acagcagaca    360
acttcaacag atccatttgg aggggaccct ttcaaagaaa gtgacccatt ccgtggctct    420
gccactgacg acttcttcaa gaaacagaca aagaatgacc catttacctc ggatccattc    480
acgaaaaacc cttccttacc ttcgaagctc gacccctttg aatccagtga tcccttttca    540
tcctccagtg tctcctcaaa aggatcagat ccctttggaa ccttagatcc cttcggaagt    600
gggtccttca atagtgctga aggctttgcc gacttcagca ctattgaagg tcgacgcggc    660
cg                                                                    662
```

```
        <210> 219
        <211> 752
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 219
cggacgcgtg ggggatctgg caatagctcc caaccctcac ttcgtgaggg ccacgacaaa     60
cctgttttta atggagctgg aaagcctcat tccagcacct cttcaccaag tgtcccaaag    120
acttctgcta gcaggactca gaaatctgct gttgagcaca aagccaaaaa atctctgtcc    180
catcctagcc attccaggcc tgggcccatg gtcacccac acaataaggc taagagtcca      240
ggtgtcaggc agccaggcag cagctctagc tcagcccctg ggcagcccag cacaggggtt    300
gctcgaccca cagttagttc tggccctgtg cctaggcgcc agaatggcag ctccagctca    360
ggacctgagc gatcaatcag tgggtccaag aagccaacca atgactcaaa tccctctagg    420
cggacagtca gtggtacatg tggccctgga caacctgcaa gcagctcagg tggccctggg    480
cgacccatca gtggttcagt tagttctgca agacccttgg gcagctctcg tggccctggc    540
cggcctgtga gcagtccaca tgaacttcga cgaccagtga gtggcttggg cccccccggg    600
cggtctgtca gtggccctgg gagatccata agtggctcaa ttccagctgg acggactgtc    660
agtaattcag tcccaggaag accagtgagc agcttgggac ctgggcaaac agttagtagc    720
tcaggtccca ctataaagcc taagtgcact gt                                  752
```

```
        <210> 220
        <211> 582
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 220
ttattattat tttgcataga gacaagcact cactgtgtta cccaggctgg ttttgaactc     60
ctgagcttaa tcagttctca cctgctttgc cctcccaaag tgctatgatt acaggtgtga    120
gccaccacgc ttggccctgc ccaggagtca ttttgtatc tacaggtatc ttcctatgct      180
gtagacagat gcccttttc aaggcaaaaa ccctagccat ttttctcttc tccttcagag      240
tctgcaacat cctctcaact catccaagtg actactgcct ggtgctcttg gggatgcagg    300
gaggcctgag aaggccaatg tctatacaga aagttctaac atagtgcact gagtcaatgt    360
gggcacttta aagcccttc acctgccaag tcacgaagca cccctatagt tgtgtttgta      420
aaatactggg gggtttgaag gggaaaaggg ataactccaa ggtaccatct ttgcatttca    480
gatccacaca acttaaagat ctgctgtcga gtgaatgggg aagtggtcca gagcagcaac    540
accaaccaga tggtattcaa gacagaggac ctgatagcct gg                        582
```

96

```
<210> 221
<211> 440
<212> DNA
<213> Homo sapiens




<400> 221
ggaattcgat cagtagaagt ttgggggata tagaaacgaa ggttttctaa cttttagctt    60
tcaaggagat tgtccggttg ggaaagcaag atatgaaaaa taaatatgtc aagaatataa   120
tccaaaacaa tctaattaag tgctagaagt ttgccatgga cagacaaagt gctacttggg   180
aaggaagttc cagaaacacc acagctgggt acattcttca ccactctgag tggtggcagt   240
gacgcgttgg ctttgtgaga atggtgtgtc ttacttgaga aagtgtgtgt gttctgcctg   300
caggcatggg actcgctgtg ctggagaagt ggcagccgct gcaaacaatt cgcactgcac   360
agtcggaatt gctttcaacg ccaagatcgg aggtatggga aaccaactca cgtggatgta   420
gaaatgcgcc agttagctct                                               440




<210> 222
<211> 489
<212> DNA
<213> Homo sapiens




<400> 222
ccgacgattt cgtgaggcgg cagccaggtg gggttccagc cagagcacgc acgcacggag    60
ccgggagcat gcagcctgca ctgcggggga tgtgatgctc ggctctaact cgcctggctg   120
gcccgccacg gacgcctcag cttgcaacca tggtaacgtt tctggcgggg gacacccccg   180
ggagcccacc gcgatgggca gcctcctggt gactgatgga cgagtgtcca cctcccagac   240
cgagagcgct tagtaggtcg gaggaagtgg agaggatgta acacgccccc agccgggagt   300
gaagccctga ggagctcctc ccccttcgt tcccaccctc aagtctgacg atgacacctc    360
caattttgat gaaccaaaga agaattcgtg ggtttcatcc tctccgtgcc agctgagccc   420
ctcaggcttc tcgggtgaag aactgccgtt tgtggggttt tcgtacagca aggcactggg   480
gattcttgg                                                           489




<210> 223
<211> 493
<212> DNA
<213> Homo sapiens




<400> 223
tttcgtcgag cgccttgcgc acctccacgc tgcctgcgcc ccgcgccgca aggtggcgct    60
cctcttggag gtgtgcagag atgtctatgc gggcctggct cgaggcgaga accaagatcc   120
cctggggcc gacgccttcc tgccggcgct gaccgaggaa ctcatctgga gcccggacat    180
tggggacacg cagctggacg tagagtttct tatggagctc ttagatccag atgagctgcg   240
gggagaggct gggtactacc tgaccacgtg gtttggggcg ctgcaccaca ttgcccacta   300
ccagcccgaa acagaccgcg ctccccgggg gctcagctcc gaggcccgcg cctccctgca   360
```

```
ccagtggcac cgcaggcgga cgctgcacag aaaggatcat cccagagccc aacagctgga      420
ctgaccctgg ctggtcgaag agccctggcc agatgtcctg tggacagacc caatttctgg      480
cctcgtctgc tgg                                                          493
```

```
<210> 224
<211> 883
<212> DNA
<213> Homo sapiens
```

```
<400> 224
agtgacctgg aaacaagttc tgatccagaa ggtgaggatt gggatgagga agctgaggat       60
gatggttttg atagtgatag ctcactgtca gactcagacc ttgaacaaga ccctgaaggg      120
cttcaccttt ggaactcttt ctgcagtgta gatccttata atccccagaa ctttacagca      180
acaattcaga ctgctgccag aattgttcct gaagagcctt ctgattcaga gaaggatttg      240
tctggcaagt ctgatctaga gaattcctcc cagtctggaa gccttcctga gacccctgag      300
catagttctg gggaggaaga tgactgggaa tctagtgcag atgaagcaga gagtcttcaa      360
actgtgggaa cttcattctg ttaattctgg atggacccct acaacccttt aaattttaag      420
gctcctttttc aaacatcagg ggaaaatgag aaaggctgtc gtgactcaaa gaccccatct      480
gagtccattg tggccatttc tgagtgtcac accttacttt cttgtaaggt gcagctgttg      540
gggagccaag aaagtgaatg tccagactcg gtacagcgtg acgttctttc tggaggaaga      600
cacacacatg tcaaaagaaa aaaggtaacc ttccttgaag aagttactga gtattatata      660
agtggtgatg aggatcgcaa aggaccatgg gaagaatttg caagggatgg atgcaggttc      720
cagaaacgaa ttcaagaaac agaagatgct attggatatt gcttgacatt tgaacacaga      780
gaaagaatgt ttaatagact ccagggaaca tgcttcaaag gacttaatgt tctcaagcaa     .840
tgttgagttg gcagcctgta gtcctagcta gcatacacta cct                        883
```

```
<210> .225
<211> 389
<212> DNA
<213> Homo sapiens
```

```
<400> 225
cggccgcgtc tacggcatat tcttttttttg gaactgtgga gaatatggct ccaaaagtgg       60
ttaatcgtcc aggtcatact cagagtgctg actgggggtc ttttgggggg ttaatgggaa      120
ggtttgaatt tgggattttt ttaaagggga aggagattgt taagtgagga tcaacaggga      180
atggtaaaga aactgggggt tttatttttct ttattttatg ccctatgtaa taaataacca      240
aaaaacatta ttgcgtgcag tataaaagga ctatgaaatc tgttagctgc gtctatctca      300
tcctaatttg aaagggcaaa aaaaaatatt accatagatt tcctgctaat agtaacaatc      360
taaagcatta atggtgttgg gtcttttgg                                        389
```

```
<210> 226
<211> 412
<212> DNA
<213> Homo sapiens
```
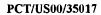
```
<400> 226
gggtttgttt ttcttccagg ccccatgtct gtgggtttgg acttctctct gccaggcatg      60
gagcatgtct atgggatccc tgagcatgca gacaacctga ggctgaaggt cactgagtga     120
gtcctatggt gacatcagga agatggaggt gggcaggaag gagtcaggcc tttagggaga     180
tgggtgtgca tattggatac tctaggcaag catgggtcat ttcttgtgtc cagaatcacc     240
tttggtgata gaaaattttt tgagaaagga caagaggagc ctttgcttat ctctcacctg     300
tgtctgtgga gtggtgttag catataacgc agcctggggc cagttagcag cccaagtctg     360
tctgtttgcc tgcaggggtg gggagccata tcgcctctac aatttggatg tg              412
```



```
<210> 227
<211> 390
<212> DNA
<213> Homo sapiens
```



```
<400> 227
gggagtgagt gccagggcac tgacctggac acccgcaact gtaccagtga cctctgtgta      60
cacactgctt ctggccctga ggacgtggcc ctctatgtgg gcctcatcgc cgtggccgtc     120
tgcctggtcc tgctgctgct tgtcctcatc ctcgtttatt gccggaagaa ggaggggctg     180
gactcagatg tggctgactc gtccattctc acctcaggct tccagcccgt cagcatcaag     240
cccagcaaag cagacaaccc ccatctgctc accatccagc cggacctcag caccaccacc     300
accacctacc agggcagtct ctgtccccgg caggatgggc ccagccccaa gttccagctc     360
accaatgggc acctgctcag cccccctgggt                                      390
```



```
<210> 228
<211> 777
<212> DNA
<213> Homo sapiens
```



```
<400> 228
cttatttata atgaagatat gatttgttgg attgaatcaa gagaatcttc aaatcaactc      60
aaatgtatcc agataacaaa agcaggagga ttaacagatg aatggacaat caatattctt     120
caatccttcc acaatgtgca acaaatggcg attgactggc tcactcgaaa tctctatttt     180
gtggaccatg tcggtgaccg gatctttgtt tgtaattcca acggttctgt atgtgtcacc     240
ctgattgatc tggagcttca caatcctaaa gcaatagcag tagatccaat agcaggaaaa     300
cttttcttta ctgactacgg gaatgtcgcc aaagtggaga gatgtgacat ggatgggatg     360
aaccgaacaa ggataattga ttcaaagaca gagcagccag ctgcactggc actagaccta     420
gtcaacaaat tggtttactg ggtagatctt tacttggact atgtgggagt agtggactat     480
caaggaaaaa atagacacgc tgtcattcaa ggcagacaag tcagacatct ttatggtata     540
actgtgtttg aagattattt gtatgcaacc aattctgata gctacaatat cgtaaggata     600
agccgattta atgggactga tattcactca ttaattaaaa ttgagaatgc ttggggaatc     660
cgaatttatc aaaaaagaac tcaaccaaca gtcagaagcc atgcatgtga agtcgatcca     720
tatggaatgc caggggctg ttcacacatc tgtctactca gcagcagtta cacgaaa         777
```

<210> 229
<211> 486
<212> DNA
<213> Homo sapiens

<400> 229
tttcgtctgg gaacccgcag cctggggact cctccggcgg gggcgctggg ggcgggctgc   60
cgtcccctgg ggagcaggag ctgagccggc gcttgcagcg cctgtatccc gcggtcaacc   120
agcaagagac tccgctgccg cgctcctgga gccccaagga caaatacaac tacattggtc   180
tctcccaggg caacctccgc gtccactaca aaggtcatgg caaaaatcac aaagatgcgg   240
cctcagtgcg tgccacccac cccatacctg ctgcctgtgg catttattac tttgaagtga   300
agattgtcag caaaggaaga gatggttaca tgggaatagg actctcggct caaggcgtca   360
acatgaacag acttcctggt tgggacaaac attcctatgg ttaccatggt gatgatgggc   420
attcgttctg ctcctcgggg actggccagc cctatggtcc cacattcacc acaggagacg   480
tgatcg   486

<210> 230
<211> 396
<212> DNA
<213> Homo sapiens

<400> 230
tttttttttt ttaagatggg gtctcgctct gtcacccagg ctggagtgca gtggtgtgat   60
gtcagctcac tgcaagctcc gcctcccagg ttcacactat tctgcctcag cctcccaagt   120
agctgggact acaggtgcgt gccaccatgc ccggctaatt ttttgtatt tttagtagag   180
acggggtttc accgtgttag ccagtatggt cttgatctcc tgacctcgtg atccacctgc   240
ctcggcctcc caaaagtgct gggattacag gtgtgagctg ctgcgcctgg cttatgagtc   300
gtatgttctg atcctccctc ttgaagttgc cttctgtggt ctaaggaggg cctgaaggtt   360
caggtaaaaa cttcagggtg accttcactg ggggtg   396

<210> 231
<211> 713
<212> DNA
<213> Homo sapiens

<400> 231
tcagctcagc ttggcacgag gaaaggtgtt cttgtgtgcc ttgtcttttg tttactttgc   60
caaagcattg gcagaaggct atctgaagag caccatcact cagatagaga gaagggttga   120
tatcccttct tcactggtgg gagttattga tggtagtttt gaaattggga atctcttagt   180
tataacattt gttagctact ttggagccaa acttcacagg ccaaaaataa ttggagcagg   240

```
gtgtgtaatc atgggagttg gaacactgct cattgcaatg cctcagttct tcatggagca    300
gtacaaatat gagagatatt ctccttcctc caattccact ctcagcatct ctccgtgtct    360
cctagagtca agcagtcaat taccagtttc agttatggaa aaatcaaaat ccaaaataag    420
taacgaatgt gaagtggaca ctagctcttc catgtggatt tatgttttcc tgggcaatct    480
tcttcgtgga ataggagaaa ctcccattca gcctttgggc attgcctacc tggatgattt    540
tgccagtgaa gacaatgcag ctttctatat tgggtgtgtg cagacggttg caattatagg    600
accaatcttt ggtttcctgt taggctcatt atgtgccaaa ctatatgttg acattggctt    660
tgtaaaccta gtcattttta ggtggaagca tgttacagca cattatcgag gaa          713
```

```
        <210> 232
        <211> 1067
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 232
        cagccttcca aggtagggca caccaaggcc taaggaatca gaaagggccc gagggtgggc     60
        tgtgtcctgg ctttcaggcc ctggggcgac caccagcctc tgctcactct gaggctccag    120
        ccaggggcgcc aagcctcagg accgtgggtg gggcccaagg acactctgga ccccccgttcc   180
        attcatgaga ggccactcagc acgccacgtg tctgctgtga cagcccgcag ggagggtgga    240
        agccttctgt aaattccaca tgtgggccga gggcatgacg tccttgatga aggccgcgct    300
        ggacctcacc taccccatca cgtccatgtt ctccggagcc ggcttcaaca gcagcatctt    360
        cagcgtcttc aaggaccagc agatcgagga cctgtggatt ccttatttcg ccatcaccac    420
        cgacatcaca gcctcggcca tgcgggtcca caccgacggc tccctgtggc ggtacgtgcg    480
        tgccagcatg tccctgtccg gttacatgcc ccctctctgt gacccgaagg acggacacct    540
        gctgatggac gggggctaca tcaacaacct cccagcggat gtggcccggt ccatgggggc    600
        aaaagtggtg atcgccattg acgtgggcag ccgagatgag acggacctca ccaactatgg    660
        ggatgcgctg tctgggtggt ggctgctgtg gaaacgctgg aacccttgg ccacgaaagt    720
        caaggtgttg aacatggcag agattcagac gcgcctggcc tacgtgtgtt gcgtgcggca    780
        gctggaggtg gtgaagagca gtgactactg cgagtacctg cgcccccca tcgacagcta    840
        cagcaccctg gacttcggca agttcaacga gatctgcgaa gtgggctacc agcacgggcg    900
        cacggtgttt gacatctggg gccgcagcgg cgtgctggag aagatgctcc gcgaccagca    960
        ggggccgagc aagaagcccg cgagtgcggt cctcacctgt cccaacgcct ccttcacgga   1020
        ccttgccgaa attgtgtctc gcattgagcc cgccaagccc gccatgg                1067
```

```
        <210> 233
        <211> 704
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 233
        tttcgtgtga gggagagccg agggaaccag cgcggtgcct agcggaactc cagggctgga     60
        atcccgagac acaagtgcat ctgctagctg ttagcacttg cagacggag ttctcctcta    120
        gggtagttct aactttgggt aataatgttt gtcagctacc tgatattaac attgctccac    180
        gttcaaacag cagtgttagc aagacctggg ggagagagca ttggctgtga tgactactta    240
        ggctccgaca aagtcgtgga caaatgtggg gtgtgtggag gagacaacac gggctgtcag    300
        gttgtgtcgg gcgtgtttaa gcatgccctc accagcctgg gctaccaccg cgtcgtggag    360
        attcccgagg gagccacgaa aatcaacatc acggagatgt acaagagcaa caactatttg    420
        gccctgagaa gtcgttctgg acgctccatc atcaatggga actgggcaat tgatcgacca    480
```

```
ggaaaatacg agggcggagg gaccatgttc acctacaagc gtccaaatga gatttcgagc    540
actgccggag agtccttttt ggcggaaggt cccaccaacg agatcttgga tgtctacgtg    600
agtttggatg tttctggact gttctttgga ttttgaatct tgtcacttct aaggaacata    660
ctctgaacaa ataagcaaca aatcattgcc catactcaat aaaa                     704
```

```
<210> 234
<211> 420
<212> DNA
<213> Homo sapiens
```

```
<400> 234
atttcaggag ggaccagaag cgcaggcccg ctcaggagga attacaactt catcgccgcg     60
gtggtggaga aggtggcgcc atcggtggtt cacgtgcagc tgtggggcag gaaccagcag    120
tggattgagg tggtgctcca gaatggggcc cgttatgaag ctgttgtcaa ggatattgac    180
cttaaattgg atcttgcggt gattaagatt gaatcaaatg ctgaacttcc tgtactgatg    240
ctgggaagat catctgacct tcgggctgga gagtttgtgg tggctttggg cagcccattt    300
tctctgcaga acacagctac tgcaggaatt gtcagcacca aacagcgagg gggcaaagaa    360
ctggggatga aggattcaga tatggactac gtccagattg atgccacaat taactatggg    420
```

```
<210> 235
<211> 1057
<212> DNA
<213> Homo sapiens
```

```
<400> 235
cccacgcgtc cgagaactca aagaaattct ggataggaaa gggcatttct cagagaatga     60
gacaaggtgg atcattcaaa gtctcgcatc agctatagca tatcttcaca ataatgatat    120
tgtacataga gatctgaaac tggaaaatat aatggttaaa agcagtctta ttgatgataa    180
caatgaaata aacttaaaca taaaggtgac tgattttggc ttagcggtga agaagcaaag    240
taggagtgaa gccatgctgc aggccacatg tgggactcct atctatatgg cccctgaagt    300
tatcagtgcc cacgactata gccagcagtg tgacatttgg agcataggcg tcgtaatgta    360
catgttatta cgtggagaac cacccttttt ggcaagctca gaagagaagc tttttgagtt    420
aataagaaaa ggagaactac attttgaaaa tgcagtctgg aattccataa gtgactgtgc    480
taaaagtgtt ttgaaacaac ttatgaaagt agatcctgct cacagaatca cagctaagga    540
actactagat aaccagtggt taacaggcaa taaactttct tcggtgagac caaccaatgt    600
attagagatg atgaaggaat ggaaaaataa cccagaaagt gttgaggaaa acacaacaga    660
agagaagaat aagccgtcca ctgaagaaaa gttgaaaagt taccaaccct ggggaaatgt    720
ccctgagacc aattacactt cagatgaaga ggaggaaaaa caggtaggaa gaatcattgc    780
tgcatttctc ccaagtgtaa aataccctca ccacacctgg aacatttttt tgcaaatctg    840
tcttttttgtt gttagtttgt aacaaaggcc gagcgttata tagcaagtaa agttctttct    900
gccttataag gctagcatga tttagcgagg tggcctacat gtttatttta aggttggtga    960
ttatgtaggg caggtgtctg caaacttttt ctgtaaggga acaaacagta aatattttag·  1020
gctttgtggg ccctagtagt ctttgtcaca actactc                            1057
```

```
<210> 236
<211> 467
<212> DNA
<213> Homo sapiens




<400> 236
ttgagtatta gtgtcagtga tgtgtctctc tctgatgaag gacagtacac ctgttcttta        60
tttacaatgc ctgtcaaaac ttccaaggca tatctcaccg ttctgggtgt tcctgaaaag       120
cctcagatta gtggattctc atcaccagtt atggagggtg acttgatgca gctgacttgc       180
aaaacatctg gtagtaaacc tgcagctgat ataagatggt tcaaaaatga caaagagatt       240
aaagatgtaa aatatttaaa agaagaggat gcaaatcgca agacattcac tgtcagcagc       300
acactggact tccgagtgga ccggagtgat gatggagtgg cggtcatctg cagagtagat       360
cacgaatccc tcaatgccac ccctcaggta gccatgcagg tgctagaaat gcactataca       420
ccatcagtta agattatacc atcgactcct tttccacaag aaggacg                     467




<210> 237
<211> 416
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(416)
<223> n = a,t,c or g




<400> 237
ggtacaacca gaaagtggat ctcttcagcc tgggaattat cttctttgag atgtcctatc        60
acccatggt cacggcttca gaaaggatct ttgttctcaa ccaactcaga gatcccactt        120
cgcctaagtt tccagaagac tttgacgatg gagagcatgc aaagcagaaa tcagtcatct       180
cctggctgtt gaaccacgat ccagcaaaac ggcccacagc cacagaactg ctcaagagtg       240
agctgctgcc cccaccccag atggaggagt cagagctgca tgaagtgctg caccacacgc       300
tgaccaacgt ggatggaaag gcctaccgca ccattgatgg gcccagatct tttcggcagc       360
gcatctcccc tgccatcgnt ttacacctat gaccagcgac atattgaagg gcaact          416




<210> 238
<211> 739
<212> DNA
<213> Homo sapiens




<400> 238
ggaccaggac tacaagtacg acagtacctc agacgacagc aacttcctca accccccag         60
ggggtgggac catacagccc caggccaccg gactttgaa accaaagatc agccagaata        120
tgattccaca gatggcgagg gtgactggag tctctggtct gtctgcagcg tcacctgcgg       180
gaacggcaac cagaaacgga cccggtcttg tggctacgcg tgcactgcaa cagaatcgag       240
```

```
gacctgtgac cgtccaaact gcccaggaat tgaagacact tttaggacag ctgccaccga      300
agtgagtctg cttgcgggaa gcgaggagtt taatgccacc aaactgtttg aagttgacac      360
agacagctgt gagcgctgga tgagctgcaa aagcgagttc ttaaagaagt acatgcacaa      420
ggtgatgaat gacctgccca gctgcccctg ctcctacccc actgaggtgg cctacagcac      480
ggccgacatc ttcgaccgca tcaagcgcaa ggacttccgc tggaaggacg ccagcgggcc      540
caaggagaag ctggagatct acaagcccac tgcccggtac tgcatccgct ccatgctgtc      600
cctggagagc accacgctgg cggcacagca ctgctgctac ggcgacaaca tgcagctcat      660
caccaggggc aaggggcggg gcacgcccaa cctcatcagc accgagttct ccgcggagct      720
ccactacaag gtggacgtc                                                   739
```

```
      <210> 239
      <211> 611
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 239
ggaatcggaa gaaaatggag agagtgcaat ggacagcaca gtggccaaag aaggcactaa       60
tgtaccatta gttgctgctg gtccttgtga tgatgaaggc attgtgacta gcacaggcgc      120
aaaagaggaa gacgaggaag gggaggatgt tgtgactagt actggaagag gaaatgaaat      180
tgggcatgct tcaacttgta cagggttagg agaagaaagt gaagggggtct tgatttgtga      240
aagtgcagaa ggggacagtc agattggtac tgtggtagag catgtggaag ctgaggctgg      300
agctgccatc atgaatgcaa atgaaaataa tgttgacagc atgagtggca cagagaaagg      360
aagtaaagac acagatatct gctccagtgc aaaagggatt gtagaaagca gtgtgaccag      420
tgcagtctca ggaaaggatg aagtgacacc agttccagga ggttgtgagg tcctatgac      480
tagtgctgca tctgatcaaa gtgacagtca gctcgaaaaa gttgaagata ccactatttc      540
cactggcctg gtcggggggta gttacgatgt tcttgtatct ggtgaagtcc cagaatgtga      600
agttgctcac a                                                           611
```

```
      <210> 240
      <211> 1090
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 240
tttttttttt ttaagcttga aataaaattt ttattttgtt ttgaattaaa tcaaccatga       60
ttattcacag tgcagtaagt gtgtatcatc tgtttgatat tttcatatta cagttttgat      120
agtgctcttc agtctgcgaa atcttctttg ggtggaaatg atgaactgtc agctactttc      180
ttagaaatga aaggacattt ctatatgtat gctggttctc tgctcttgaa gatgggtcag      240
catggtaata atgttcaatg gcgagctctt tctgagctgg ctgcgttgtg ctatctcata      300
gcatttcagg taagtcttcc acttggagca attgacattt cacggagtct tgatgtgttt      360
taaatgaagg tgtgctctgg tatgtaatga caatatgtga acaaacctgt ggaattaaag      420
ttaaaatgaa atagtcaatt tgatacagtg gaaaataact aagcatacac aatactggtg      480
aggctggtga acagggatg ttgaatgcac tcttgtcgaa agcctgcatt gccatgattt      540
gtttgtagac aaatttgaag agtttgatct ttttactctg ccatttttgg gaacatgata      600
aagatgtaat ctcgtattat gggtaaagct tgattcaaaa agatgtgtta cttggacaaa      660
atcctaataa gtagacgtag ggcaatggct ttatagccta tgatagaaga atatgattgc      720
aatttaacat gttaattgaa acacatgtat ataacattta tgactgtatt gtgtatatgt      780
aacagtatat ctattaatct ttgaaaacat aaaacctttt cttatttttt atttttttat      840
```

```
ttttttttga gaccaagtct ctctctgtcg ccaggctgga gtgcagtggt gtgatctcgg   900
ctcactgcag cctccacctc ctgggttcga gtgattctcc tgcctcagcc tcccgagtag   960
ctgggactac aggcccatgc taccaagccc agctaatttt ttgtattttt aatagagatg  1020
gggtttcacc atgttggcca ggatggtcgc aatctcttga cctcttgatc tacctgcctt  1080
ggtctcccaa                                                         1090
```

```
        <210> 241
        <211> 680
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 241
gcaacaccca tcccaggaaa agccacaagt cctgaccccc agccccagga agcagaagct    60
gaacagaaag tacaggtccc accatgacca gatgatctgc aagtgcctct ccctgagcat   120
atcctactcc gctaccattg gcggcctgac caccatcatc ggcacctcca ccagcctcat   180
cttcctggaa cacttcaaca accagtatcc agcctcagag gtggtgaact ttggcacctg   240
gttcctcttc agcttcccca tatccctcat catgctggtg gtcagctggt ctggatgca    300
ctggctgttc ctgggctgca attttaaaga gacctgctct ctgagcaaga agaagaagac   360
caaaagggaa cagttgtcag agaagaggat ccaagaagaa tatgaaaaac tgggagacat   420
tagctaccca gaaatggtga ctggattttt cttcatcctg atgaccgtac tgtggtttac   480
ccgggagcct ggctttgtcc ctggctggga ttctttcttt gaaaagaaag ctaccgtac    540
tgatgccaca gtctctgtct ccttggctt cctcctcttc ctcattccag cgaagaagcc    600
ctgctttggg aaaaagaatg atggagagaa ccaggagcac tcactgggga ccgagcccat   660
catcacgtgg aaggacttcc                                              680
```

```
        <210> 242
        <211> 491
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 242
cttgaaagag aaggggacaa aggaacacca gtattaagag gattttccag tgtttctggc    60
agttggtcca gaaggatgcc tccattcctg cttctcacct gcctcttcat cacaggcacc   120
tccgtgtcac ccgtggccct agatccttgt tctgcttaca tcagcctgaa tgagccctgg   180
aggaacactg accaccagtt ggatgagtct caaggtcctc ctctatgtga caaccatgtg   240
aatggggagt ggtaccactt cacgggcatg gcgggagatg ccatgcctac cttctgcata   300
ccagaaaacc actgtggaac ccacgcacct gtctggctca atggcagcca cccctagaa    360
ggcgacggca ttgtgcaacg ccaggcttgt gccagcttca atgggaactg ctgtctctgg   420
aacaccacgg tggaagtcaa ggcttgccct ggaggctact atgtgtatcg tctgaccaag   480
cccagcgttt g                                                       491
```

```
        <210> 243
        <211> 983
        <212> DNA
```

<213> Homo sapiens

        <400> 243
tgcggccgca ccatgagcga catccgccac tcgctgctgc gccgcgatgc gctgagcgcc   60
gccaaggagg tgttgtacca cctggacatc tacttcagca gccagctgca gagcgcgccg   120
ctgcccatcg tggacaaggg ccccgtggag ctgctggagg agttcgtgtt ccaggtgccc   180
aaggagcgca gcgcgcagcc caagagactg aattcccttc aggagcttca acttcttgaa   240
atcatgtgca attatttcca ggagcaaacc aaggactctg ttcggcagat tattttttca   300
tcccttttca gccctcaagg gaacaaagcc gatgacagcc ggatgagctt gttgggaaaa   360
ctggtctcca tggcggtggc tgtgtgtcga atcccggtgt tggagtgtgc tgcctcctgg   420
cttcagcgga cgcccgtggt ttactgtgtg aggttagcca aggcccttgt agatgactac   480
tgctgtttgg tgccgggatc cattcagacg ctgaagcaga tattcagtgc cagcccgaga   540
ttctgctgcc agttcatcac ctccgttacc gcgctctatg acctgtcatc agatgacctc   600
attccaccta tggacttgct tgaaatgatt gtcacctgga ttttttgagga cccaaggttg   660
attctcatca cttttttaaa tactccgatt gcggccaatc tgccaatagg attcttagag   720
ctcacccccgc tcgttggatt gatccgctgg tgcgtgaagg caccccctggc ttataaaagg   780
aaaaagaagc cccccttatc caatggccat gtcagcaaca aggtcacaaa ggacccgggc   840
gtggggatgg acagagactc ccacctcttg tactcaaaac tccacctcag cgtcctgcaa   900
gtgctcatga cgctgcagct gcacctgacc gagaagaatc tgtatgggcc gcctggggct   960
gatcctcttc gaccacatgg tcc   983

        <210> 244
        <211> 526
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(526)
        <223> n = a,t,c or g

        <400> 244
cggctcgtcc nnatttgaac cccttctttg atcggcctgc agtaccgggc cggaattacc   60
cggtcgagcc acgcgttcgc tcacgcgtcc ggccaaccag aagggttgcg acggggaccg   120
cctgtactac gacggctgtg ccatgatcgc catgaacgga agcgtctttg ctcaaggatc   180
ccagtttttct ctggatgacg tggaagtcct gacggccacg ctggatctgg aggacgtccg   240
gagctacagg gcggagattt catctcgaaa cctggcggtg agtgctccag tagacacctg   300
tgtgggatgc tcatcaaaga cgtggaaagt ggccccattc gtgcgggcct ggtggaggcc   360
gtgagggtgc agtgcctgaa aagtctgaca gggaagttcc ggacttcccg agcgtggaaa   420
ggggctggtg ccgcagacag aacctgcttc catctgttcc ccgtcatcct ctgcttgggc   480
caggccctga ctggggtga gctggggaca ggcaggcagg tgtatt   526

        <210> 245
        <211> 418
        <212> DNA
        <213> Homo sapiens
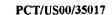
```
        <400> 245
gggggcgggcc cccccaggtag gcatggctgc tgcccccagc ccatttcttt tgaatctgtt        60
cactcctatt cactcctact tgccactcct tctattcatt actcactgcc cctgcccta         120
gtccccatgg taccccctgag ccatgggcat ttcctgagcc ccactcagca ggctctgctt        180
cccccaggtc ctggtgaacg agggcggtgg ctttgaccgg gcctctggct ccttcgtagc        240
ccctgtccgg ggtgtctaca gcttccggtt ccatgtggtg aaggtgtaca accgccaaac        300
tgtccaggtg acctcagcac tggccccccat ccccggctca ggagggtggg gagggggaag        360
aaggggagcc cagctgacct ccgggtggac tctccattga cctgtgtcct ggacgaaa         418
```

```
        <210> 246
        <211> 706
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 246
acctcatatt attggagcag aagatgatga ttttggtact gaacatgaac agatcaatgg        60
acagtgcagc tgtttccaga gcattgaatt gctaaaatct cgcccggctc atttggctgt        120
tttcttacgc catgtagttt cacaatttga ccctgcgact ttgctttgtt atctctattc        180
agacctgtat aaacatacca attccaaaga aactcgtcgc atcttccttg agtttcatca        240
gttctttcta gatcgatcag cacacctgaa agtttctgtt cctgatgaaa tgtctgcaga        300
tctagaaaag agaagacctg agctcattcc tgaggatctg catcgccact atatccaaac        360
tatgcaagaa agagtccatc cagaagttca aaggcactta gaagattttc ggcagaaacg        420
tagtatggga ctgaccttgg ctgaaagcga gctgactaaa cttgatgcag agcgagacaa        480
ggaccgattg actttggaga aggagcggac atgtgcagaa cagattgttg ccaaaattga        540
agaagtattg atgactgctc aggctgtaga ggaagataag agctccacca tgcagtatgt        600
tattctcatg tatatgaagc atttgggagt aaaagtgaaa gagcctcgaa atttggagca        660
caaacggggt cggattggat ttcttcccaa aatcaagcaa agtatg                       706
```

```
        <210> 247
        <211> 439
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 247
caagggaggg gggttgatcc cctggcacag gtcgaggccc tggacccaca tcctttgtct        60
gcctccccac cccacagtgc ccgttcatcg acgatttcat cctggccctc cataggaaga        120
tcaagaatga gcccgtggtg tttcctgagg ggccagaaat cagcgaggag ctcaaggacc        180
tgatcctgaa gatgttagac aagaatcccg agacgagaat tggggtgcca gacatcaagt        240
tgcacccttg ggtgaccaag aacgggagg agcccttcc ttcggaggag gagcactgca        300
gcgtggtgga ggtgacagag gaggaggtta agaactcagt caggctcatc cccagctgga        360
ccacggtgat cctggtgaag tccatgctga ggaagcgttc ctttgggaac ccgtttgagc        420
cccaagcacg aatggcgaa                                                     439
```

<210> 248
<211> 730
<212> DNA
<213> Homo sapiens

<400> 248
cccacgcgtc cggaataaag atagataaga cttccgatgg accaaaactt ttcttaacag   60
aagaagatca aaagaaactt catgattttg aagagcagtg tgttgaaatg tatttcaatg   120
aaaaagatga caaatttcat tctgggagtg aagagagaat tcgtgtcact tttgaaagag   180
tggaacagat gtgcattcag attaaagaag ttggagatcg tgtcaactac ataaaaagat   240
cattacaatc attagattct caaattggcc atttgcaaga tctttcagcc ctgacggtag   300
atacattaaa aacactcact gcccagaaag cgtcggaagc tagcaaagtt cataatgaaa   360
tcacacgaga actgagcatt tccaaacact tggctcaaaa ccttattgat gatggtcctg   420
taagacccttc tgtatggaaa aagcatggtg ttgtaaatac acttagctcc tctcttcctc   480
aaggggatct tgaaagtaat aatcctttc attgtaatat tttaatgaaa gatgacaaag   540
atccccagtg taatatattt ggtcaagact tacctgcagt accccagaga aaagaattta   600
attttccaga ggctggttcc tcttctggtg ccttattccc aagtgctgtt tcccctccag   660
aactgcgaca gagactacat ggggtagaac tcttaaaaat atttaataaa aaacaaaaaa   720
aaagggcggc   730

<210> 249
<211> 466
<212> DNA
<213> Homo sapiens

<400> 249
attgctgccg ctggatcgac tgctttgcct tgtacgacca gcaggaggag ctcgtgcggc   60
acatcgagaa ggtccacatc gaccagcgca aggggagga cttcacttgc ttctgggccg   120
gttgccctcg aagatacaag cccttcaacg cccgctataa actgctgatc cacatgagag   180
tccactctgg ggagaagccc aacaagtgta cgtttgaagg ttgcgagaag gccttttcaa   240
ggcttgaaaa tctcaagatc cacttgcgga gccacacagg cgagaagccg tatttgtgcc   300
agcatccggg ttgtcagaag gccttcagta actccagtga ccgcgccaaa caccagcgga   360
cgcatctgga cactaaacct tatgcttgtc aaattccagg atgtaccaaa cgctacacag   420
acccaagttc cctaagaaag catgtgaagg cacattcttc caaaga   466

<210> 250
<211> 963
<212> DNA
<213> Homo sapiens

<400> 250
ggagcggctg ccacggaaaa cgcctggccg gacggtggct ggcggccctg cctgggcgcg   60

108

```
gagggcggcg gtggcgggcc ccgcggcctt ctctcagctt cctttctcct cacgacggcc    120
tccacagtcc ggagcccggc ggagcccgga cctggcgggg agagctgcct ccacggccgg    180
gcacccagac cccaccgtcg cagtcgccac cacctcagtc catccttggt accggcaatg    240
ggcttcgtat cctccagtgc acttgtaact gacttggaca cggaatacta agaactcact    300
tctgtcctca tcccagtcgc gccggcggtg accatctcgg ctcttttggg cttaactgcc    360
gctcctctgg actctgtctg actttggggg caccatggac caaagtggga tggagattcc    420
tgtgaccctc atcattaaag caccgaatca gaaatacagt gaccagacta ttagctgctt    480
cttgaactgg accgtgggga aactaaaaac gcatctatct aacgtttacc ctagcaaacc    540
agtaagtgtg taaaagctgg gggcagctgc tctgaccagc agcttttcgt gccgtgtacc    600
ctcctttttc ctgcttctcc cctccagtct tgaatcaaat aggtctcttt tggtagaccg    660
cgaggtattt tgagttctga ggttgtgtct cctgagtgtt cgaaccatca ttaatatttt    720
cctgatgagg ttcagttaat tagtaagagg aagcagaaat atcaagggac ttaagaattg    780
gcaggcaaag accgggcgcg gtggctcacg cctgtaatcc cagcactttg ggaggccaag    840
gcgggcggat cacgaggtca ggagttcgag accagcctta ccggcatggt gaaaccctgt    900
gtctactgaa aatacaaaaa ttaactgggc gtggtggcgc atgcttgtaa tcccagctac    960
tcg                                                                 963
```

```
<210> 251
<211> 894
<212> DNA
<213> Homo sapiens
```

```
<400> 251
gcggggaccc ggatgtgtgt ggtggcggcg gccgaagagc ttgtgtgcgg agctgagagg     60
cctatggatg aggaggacgc ggcggccccg gtttgttctc atgaacaaga tggatgacct    120
caacctgcac taccggtttc tgaattggcg ccgggggatc cgggagattc gagaggtccg    180
agctttccga tatcaggaga ggttcaaaca tatccttgta gatggagata ctttaagtta    240
tcatggaaac tctggtgaag ttggctgcta cgtggcttct cgacccctga ccaaggacag    300
caattatttt gaggtgtcta ttgtggacag tggagtccgg ggcaccattg ctgtggggct    360
ggtccctcag tactacagct tggatcacca gcctggctgg ttgcctgact ctgtagccta    420
ccatgctgat gatggcaagc tgtacaatgg ccgagccaag ggccgccagt ttgggtcaaa    480
gtgcaactcc ggggaccgga ttggctgtgg cattgagcct gtgtcctttg atgtgcagac    540
cgcccagatc ttcttcacca aaaatgggaa gcgggtgggc tctaccatca tgcccatgtc    600
cccagatgga ctgttcccag cagtgggcat gcactccctg ggtgaggagg tgcggctgca    660
cctcaacgct gagctgggcc gtgaggacga cagcgtcatg atggtggaca gttacgagga    720
tgaatggggc cggctacatg atgtcagagt ctgtgggact ctgctggagt acttagggaa    780
gggcaaaagc atcgtggatg tggggctggc ccaggcccgg cacccactca gcacccgcag    840
ccactacttc gaggtggaga tcgtggaccc tggagagaaa tgctacatcg ccct          894
```

```
<210> 252
<211> 861
<212> DNA
<213> Homo sapiens
```

```
<400> 252
tccgggggtcg acgatttcgt ctggagtgtt agcaccagta ctggatgtga cagcaggcag     60
aggagcactt agcagcttat tcagtgtccg attctgattc cggcaaggat ccaagcatgg    120
aatgctgccg tcgggcaact cctggcacac tgctcctctt tctggctttc ctgctcctga    180
```

```
gttccaggac cgcacgctcc gaggaggacc gggacggcct atgggatgcc tggggcccat          240
ggagtgaatg ctcacgcacc tgcgggggag gggcctccta ctctctgagg cgctgcctga          300
gcagcaagag ctgtgaagga agaaatatcc gatacagaac atgcagtaat gtggactgcc          360
caccagaagc aggtgatttc cgagctcagc aatgctcagc tcataatgat gtcaagcacc          420
atggccagtt ttatgaatgg cttcctgtgt ctaatgaccc tgacaaccca tgttcactca          480
agtgccaagc caaaggaaca accctggttg ttgaactagc acctaaggtc ttagatggta          540
cgcgttgcta tacagaatct ttggatatgt gcatcagtgg tttatgccaa gtaagtgctg          600
atttgttctc attcaacttg tccagagggt ttcaatgtct ttgtgtaaat ggtttacata          660
gtctcactct ctgaatcact catctttaca ctttttagag tttgtaaatg gtgaaagatt          720
tgaaaattaa ggtatgattt cagtgaaaag taccaagtgt tgtattgtgc gaaggaaaag          780
tagactagag ttattttttct ttccttgagt gtcacttgaa tataaaagaa taaaaatttt          840
tgaatagtgt taaaaaaaaa a                                                   861
```

```
        <210> 253
        <211> 556
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 253
caggctgtta agacaagagc ttgtggtgct ttgccacctt caccacccca gtttgatatc           60
tttgctggca gctgggattc gtccccggat gttggtgatg gagttagcct ccaagggttc          120
cttggatcgc ctgcttcagc aggacaaagc cagcctcact agaaccctac agcacaggat          180
tgcactccac gtagctgatg gtttgagata cctccactca gccatgatta tataccgaga          240
cctgaaaccc cacaatgtgc tgcttttcac actgtatccc aatgctgcca tcattgcaaa          300
gattgctgac tacggcattg ctcagtactg ctgtagaatg gggataaaaa catcagaggg          360
cacaccaggg tttcgtgcac ctgaagttgc cagaggaaat gtcatttata accaacaggc          420
tgatgtttat tcatttggtt tactactcta tgacattttg acaactggag gtagaatagt          480
agagggtttg aagtttccaa atgagtttga tgaattagaa atacaaggaa aattacctga          540
tccagttaaa gaatag                                                        556
```

```
        <210> 254
        <211> 435
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 254
caaaggccag taatagtacc catgagtttc gtattggcct acctgagggg tgggaatccg           60
aaaaaaaggc agttatcccc ctggggatcg ggccacccct gactttaatc tgcctagggg          120
ttctgggggg tattctcatc tacgggagga aaggcttcca aactgcccac ttttacttaa          180
aggacagtcc atcccctaaa gtaatatcca ccccctccacc acctatcttt ccaatttcaa          240
aggaggtcgg accaattcca ataaagcact ttccaaagca tgtggcaaat ttacatgcaa          300
gtaggggggtt tactgaaaaa tttgaaacac tgaaaaagtt ttaccaggaa gggcaaagct          360
gtactgttga cttaggtatt acagcaaaca gctccaacca cccagacaac aggcacagga          420
atcgatcctt aattg                                                         435
```

```
<210> 255
<211> 698
<212> DNA
<213> Homo sapiens


<400> 255
cctcatttcc tgatcgaaca gcctcacttg tgttgctgtc agtgccagta gggcaggcag      60
gaatgcagca gagaggactc gccatcgtgg ccttggctgt ctgtgcggcc ctacatgcct     120
caccagccat acttcccatt gcctccagct gttgcacgga ggtttcacat catatttcca     180
gaaggctcct ggaaagagtg aatatgtgtc gcatccagag agctgatggg gattgtgact     240
tggctgctgt catccttcat gtcaagcgca gaagaatctg tgtcagcccg cacaaccata     300
ctgttaagca gtggatgaaa gtgcaagctg ccaagaaaaa tggtaaagga aatgtttgcc     360
acaggaagaa acaccatggc aagaggaaca gtaacagggc acatcagggg aaacacgaaa     420
catacggcca taaaactcct tattagagag tctacagata aatctacaga gacaattcct     480
caagtggact tggccatgat tggttagtct cgctctgtca cacaggctgg agggcagtgg     540
cgggatctcg gttcacccca acctttgcct cacgggttca agggattctc gtgcctcagc     600
cttccaagtg gctgggattg caggtgtgcg ccagtacgcc tggctagttt tagtattttt     660
tgttacagac ggggtttcac catgttggct gggctggt                             698



<210> 256
<211> 736
<212> DNA
<213> Homo sapiens


<400> 256
gtttgaacag cccggaaacc cgggcgaccc acgcgtacga actccgcccc catggggggcc     60
ccacttttttc gctttgattc cttcttcccc caaagaggtc ccagctaccc catcctccag    120
aagggacccc attgccccaa cagcgactct tctctctaaa aagaccccag caactctagc    180
ccccaaagag gccctcattc ccccagctat gactgttccc tcccctaaaa agaccccagc    240
aattccaacc cccaaagaag ccccagctac cccatcctcc aaagaggcct ccagtccccc    300
agcagtgact ccttccactt acaaaggggc cccatccccc aaagagctcc tcattccacc    360
agctgtgact tctccttccc ccaaagaggc acctactcct ccagctgtga ctcctccatc    420
ccccgaaaag ggcccagcaa ctccagcccc caaagggact cccacttccc cacctgtgac    480
tccttcctcc ctcaaagact cccctacttc cccagcttct gtcacatgta aaatgggggc    540
cactgttcct caagcatcta aagggcttcc agcaaagaaa ggccccacag ctctgaaaga    600
agtacttgtt gccccagctc cagaaagcac gccaatcatc acagctccca ctcggaaagg    660
tccacagacc aaaaagagtt ctgctacttc acctcctata tgcccagatc cctcagctaa    720
gaatggttct aaagga                                                      736



<210> 257
<211> 77
<212> DNA
<213> Homo sapiens
```

```
        <400> 257
ctccgcctcc caaagtactg ggattacagg tgtgagccac cgtgcccagc caagaccttg      60
tatctttaaa aaaaaaa                                                     77




        <210> 258
        <211> 499
        <212> DNA
        <213> Homo sapiens




        <400> 258
aatgctcctt tggtaagaac aattatatgg ctaaattaat ctcagccacc tagttctaaa      60
tgtagagcaa ggattgcaag ggattattta gacaagttca tcaattaagt aaaattagac     120
atgaaggata taagaatgaa tgataaagca agctaaaaat ggtgaaacaa gggatgtctg     180
attggaagta gaagatattt atttaggttc taggacatta gtatcagtga ggacagtaat     240
ttcctgcttg tttgtatttc agtgatcaca tacacttctt tacctgataa cgtctctctt     300
ctctaggctg gttttggtta cggcttgcca atttctcgtc tgtatgccaa gtactttcaa     360
ggagatctga atctctactc tttatcagga tatggaacag atgctatcat ctacttaaag     420
gtatcccttg aattcaatag caaaatcctg tttctaaaac cattgctcct tttatagccc     480
tgagtgctat ggtccggag                                                  499




        <210> 259
        <211> 621
        <212> DNA
        <213> Homo sapiens




        <400> 259
tttcgtgact gtagtcagcc cttagtggat gagagcgcct atgcttcaga aacagcaggc      60
tcccaggatg gacaccccgc cccctgaaga acgcttagag aagcaaaatg aaaaactgaa     120
caaccaggaa gaggagacgg agtttaagga actggacggt ctgagggaag ccttggcaaa     180
cctccgggga ctgtcagagg aggagaggag cgagaaggct atgcttcgct cccgcattga     240
agagcagtcc cagctcatct gcatcctgaa gcggaggtca gatgaggccc tggagcgctg     300
ccagatccta gagctgctca atgcagagct ggaggagaag atgatgcagg aggctgagaa     360
gctcaaggcc cagggtgagt acagtcggaa actagaggaa cgctttatga ccctagcagc     420
caaccacgag ttgatgctcc gcttcaagga tgaatacaag agtgagaaca tcaagctgag     480
ggaggagaat gagaagctga ggctggagaa taacagcctc ttcagccagg ctctgaagga     540
tgaggaggcg aaagtattac agctcacagt ccggtgtgag gccctcactg gggagctaga     600
aacgctgaag gagaggtgtg c                                               621




        <210> 260
        <211> 414
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 260
agatccgggt gcgagccacg cgtccgtgca ggtgcaggta ctgaaagagc aacttttttgc      60
tgggcgtatg ccttcaccct tccgctcctg cgcactcatg ggaatgtgtg gcagtagaag     120
cgctgataac ttgtcatgcc cttctccatt gaatgtaatg gaaccagtaa gcttctttcc     180
tcttaaatca ctggggaagg gaatgataca acatttcaga cacatagttt ccctagttta     240
gatgaaatat atgtttattt taaatacata atttgataaa ttattgttga ttggaagtga     300
ctttcacctt tgaaagtcca ttgctgtctg aagccactag aaagccacct gaattgcaat     360
agtgatttat ctttctgact aaaggaggta atgcaccata aaaacatgta cagt           414
```


```
        <210> 261
        <211> 620
        <212> DNA
        <213> Homo sapiens
```


```
        <400> 261
gtaaccacca ctactcatag cgttggacga gggcatgagc tacagttgct taatgaagaa      60
ctgagaaaca ttgagcttga gtgtcagaat atcatgcagg ctcacaggct ccagaaagtg     120
acagaccagt atggagacat ctggacattg catgatggag gattccggaa ttataacacc     180
agcatagata tgcaaagggg aaagctagat gacatcatgg agcatccaga aaagtctgac     240
aaggacagtt ctagtgctta caacacagct gagagctgca gaagtactcc gctcactgta     300
gaccgttccc ctgacagttc ccttccaagg gtgatcaacc tcaccaataa gaaaaacctg     360
agaagcacaa tggcagccac ccagtcctct tccggacaga gcagtaaaga gtcgacctcc     420
accaaagcca aaaccactga gcaaggttgt agcgctgaaa gcaaggagaa ggttttagaa     480
ggcagcaagc ttcctgatca agagaaggca gtcagcgaac acatccctta cctctctcct     540
taccacagct cctcatatag atatgcaaac atcccagcac acgcccggca ttatcaaagc     600
tacatgcagt taattcaacg                                                 620
```


```
        <210> 262
        <211> 418
        <212> DNA
        <213> Homo sapiens
```


```
        <400> 262
gggtctgggg ctgcctggcc accgtgtcca cccacaagaa gatccaagga ctgccatttg      60
ggaactgcct gcccgtcagt gatggcccct tcaacaatag cactgggatt cctttcttct     120
acatgacagc caaggacccc gtggtggctg atctgatgaa gaaccccatg gcctcgctga     180
tgctgccaga atcagaaggg gagttctgca gaaaaaacat cgttgatccg gaagatcccc     240
gatgtgtcca gttaacgctc actggccaga tgatcgcagt gtctccagaa gaagtagaat     300
ttgccaagca agccatgttt tcaaggcacc cagggatgag gaagtggcct cgtcaatatg     360
aatggttctt tatgaagatg aggatagaac atatctggct tcagaaatgg tatggagg       418
```

113

<210> 263
<211> 441
<212> DNA
<213> Homo sapiens

<400> 263
```
tttcgtcaga gccgcgggag gacggttgcc tggtattatt agcaagcagc aaatatggcg    60
gtggcgcgcg tggacgcggc tttgcctccc ggagaaggat cagtggtcaa ttggtcagga   120
cagggactac agaaattagg tccaaattta ccctgtgaag ctgatattca cactttgatt   180
ctggataaaa atcagattat taaattggaa aatctggaga aatgcaaacg attaatacag   240
ttatcagtag ctaataatcg gctggttcgg atgatgggtg tggccaagct gacgttgctt   300
cgtgtattaa atttgcctca taatagcatt ggctgtgtgg aagggctaaa ggaactagta   360
catctggaat ggctgaattt ggcaggaaat aatcttatag ccatggaaca gatcaatagc   420
tgcacagctc tacagcatct c                                             441
```

<210> 264
<211> 832
<212> DNA
<213> Homo sapiens

<400> 264
```
tatttcgagc ggcagttggg gcggtaccag agggtgcctg gaaggatacg gcccagctcc    60
acaagagcga ggaggcgaag cgggtgctgc ggtattacct cttccagggc cagcgctata   120
tctggatcga gacccagcaa gccttctacc aggtcagcct cctggaccat ggccgctctt   180
gtgacgacgt ccaccgctcc cgccatggcc tcagcctcca ggaccaaatg gagaggaagg   240
ccatttacgg ccccaacgtg atcagcatac cggtcaagtc ctacccccag ctgctggtgg   300
acgaggcctt cagcatcgcg ctgtggctgg ctgaccacta ctactggtac gccctgtgca   360
tcttcctcat ttcctccatc tccatctgcc tgtcgctgta caagaccaga aagcaaagcc   420
agactctaag ggacatggtc aagttgtcca tgcgggtgtg cgtgtgccgg ccaggggag   480
aggaagagtg ggtggactcc agtgagctag tgcccggaga ctgcctggtg ctgtcccagg   540
agggtgggct gatgccctgt gatgccgccc tggtggccgg cgagtgcatg gtgaatgata   600
gctctctgac aggagagagc attccagtgc tgaagacggc actgccggag gggctggggc   660
cctactgtgc agagacacac cggcggcaca cactcttctg cggaaccctc atcttgcatg   720
cccgggccta tgtgggaccg cacgtcctgg cagtggtgac ccgcacaggt atgagccggg   780
aggctgggct tgagagagat ccgggctcag cacccttgaa gaggtggagt gg           832
```

<210> 265
<211> 714
<212> DNA
<213> Homo sapiens

<400> 265
```
tttcgtcggg ggcgggctcc accttcacct ctgccttctg ctctgcttca tgctgcccga    60
```

```
ggacgctgcc atggctgtgc tgacggcctc caaccacgtg agcaacgtca ccgtgaacta    120
caacatcacc gtggagcgga tgaacaggat gcagggcctg cgggtctcta cagtgccagc    180
cgtgctgtcc cccaatgcca cgctggcact gacggcgggc gtgctggtgg actcggccgt    240
ggaggtggcc ttcctgtgga cctttgggga tggggagcag gccctccacc agttccagcc    300
tccatacaac gagtccttcc cggttccaga cccctcggtg gcccaggtgc tggtggagca    360
caatgtcacc cacacctacg ctgccccagg tgagtacgtc ctgaccgtgc tggcatctaa    420
tgccttcgag aaccggacgc agcaggtgct gatccgcagt ggccgggtgc ccattgtgtc    480
cttggagtgt gtgtcctgca aggcacaggc cgtgtacgaa gtgagccgca gctcctacgt    540
gtacctggag ggccgctgcc tcaattgcag cagcggctcc aagcgagggc ggtgggctgc    600
acgtacgttc agcaacaaga cgctggtgct ggatgagacc accacatcca cgggcagcgc    660
aagcatgtga ctggtgctgc ggcggggcgt gctgcgggac ggcgagggat acac           714
```

```
        <210> 266
        <211> 1872
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 266
        cccggaattc ctgggtcgac tatttcgtgg aaaggctgcc actctgcatg tgcacagtga     60
        ccagaagccc cttcacgatg gggccctcgg gtcgcagcag aacttggttc gcatgaagga    120
        ggcgctgagg gccagcacca tggacgtcac cgtggtcctg cctagtgggc tggagaagag    180
        gagcgtgctc aatgggagcc atgcgatgat ggacctactg gttgaacttt gccttcagaa    240
        ccacctgaat ccatcccacc atgcccttga aattcggtct tcagaaaccc aacaaccttt    300
        gagtttttaag ccaaatactt tgattgggac cctgaatgtg catactgtgt ttctgaaaga    360
        aaaagttcct gaagagaagg ttaagcctgg tcccctaag gtgcctgaga aatctgtgcg    420
        tttggtcgtg aattacctgc ggacacaaaa agctgttgtg cgtgtgagcc ctgaggttcc    480
        tctccagaat attctcccag tcatttgtgc aaagtgtgag gtcagcccag agcacgtggt    540
        tctcctcagg gacaacattg ccggagagga gctggagctg tccaagtccc tgaacgagct    600
        cgggataaag gagctctacg cgtgggacaa cagaagagaa acctttagga aatcatcact    660
        tggcaatgat gagacagata aagagaagaa aaaatttctg ggattttca aagttaataa    720
        aagaagcaat agtaagggct gtttaacgac ccccaactcc ccatccatgc actcacgttc    780
        tcttacgctg ggtccatccc tctcgctggg cagcatctca ggggtgtccg tgaagtcgga    840
        gatgaagaag cgccgagccc ctcctcctcc aggttcaggg ccacctgtgc aagacaaggc    900
        atcggaaaag gtatctcttg ggtcacagat tgatttacag aagaagaagc ggcgagcgcc    960
        agctcccccct ccaccacagc caccaccacc gagtcccctg atccccaacc gcactgagga   1020
        taaggaggag aacaggaaga gcacgatggt ttattgctgt gcgtcattcc ctactcaggc   1080
        caagcgcttc tgatggacgg gcctcttcct gacctcggac ctttcccagt gtctcttctg   1140
        ccctggctct gattttcctg ttgttcttcc tcctttcagg ataaaagggc tcattgtata   1200
        cccagaattt acttcctttg gggtttacat ataaatgcat taataacaga gatttgtttg   1260
        attgaggttt atatttttt gaaggaggta aattatatgc aaatttttagg ttgataatat   1320
        tcacctgtct gaaattcact gatacttgga aatgttcctg tgaagaactc tgctttattt   1380
        taattcatta ttaattcatg ttttcttat tggatattca gttccagaat ttattgccaa   1440
        tttttcttaa aactagattg tatccataaa ttgaccagta tagtcaattt ggatagaact   1500
        gaaactttct gtctacctgg taaaactaag tgcctaaaaa catgaactat aaatgtagtt   1560
        actaggaact cacaacttat atatactatc cattcaatga tacataggac ccaatgtctt   1620
        tgtgtttttg aggttttcct gttactgtgt actttgccat tttacatagt tcactaaaaa   1680
        gaaagaagtg ggagaagaag gggggtctat tcattattct atattatgat tctcttcatt   1740
        attctgttct cttcattatt ctattcattt cttcacccat ttattcacta aacagtgaca   1800
        tagtacttac ttgatgctag gtattacacc agtttttgtgg gctataagag tgaataacaa   1860
        gcacgtgacc tt                                                        1872
```

```
        <210> 267
```

```
<211> 684
<212> DNA
<213> Homo sapiens


<400> 267
tgtagataca gagtagctaa ttctaaaatt catatggaag gcaaagaaac taaattagcc    60
aaaacaattt tgaaaaagat ttcaaaaaaa ttttgaagga atcatgctgc ccagtttaa    120
gacttactat aaagctgtga taatcaaggc aatctggtat ttatgaaagg ataaacacat   180
agatcaatgg aataaagtcc aaaaccagac tcacataaat agcaattgat ttctgacaaa   240
ggtgaaaaga caactcaatg gggaatggag agtttttcaa cagatgattt taaaacaact   300
gaacatccat atgcaaaaaa ataaacctac ctaaatttca cagcttatac aaaaattaac   360
ctaaaatgga tcacggatct aaatgtagaa ctaaatttat aaaatttta gaagaaaaaa    420
atccataggc cgggcacggt ggctcatgcc tgtaatccca gcacttcaga ggctgaggcg   480
ggcagatccg ttgaggtcag ttcaagacca gcctagccta tgtggtgaaa tcccaactct   540
actaaaaata aaaaataaaa aaaaatggg ctgggagtgg tggtgcacac ctgtagtccc   600
agctacttgg gagactgaag cacaagaatc acttgaaccc agcaggcaga ggttgcagtg   660
agtggagatt gtgccactgc accc                                           684




<210> 268
<211> 453
<212> DNA
<213> Homo sapiens


<400> 268
ggtcgacgat ttcgcccgcc gtcggacgag gagcgggagc cgtgggagcc gtggacgcag    60
ctgcgcctgt cgggccacct gaagccgctg cactacaatc tgatgctcac cgccttcatg   120
gagaacttca ccttctccgg ggaggtcaac gtggagatcg cgtgccggaa cgccacccgc   180
tacgtagtgc tgcacgcttc ccgagtggcg gtggagaaag tgcagctggc cgaggaccgg   240
gcgttcgggg ctgtccctgt agccggtttt ttcctctacc cgcaaaccca ggtcttagtg   300
gtggtgctga ataggacact ggacgcgcag aggaattaca atctgaagat tatctacaac   360
gcgctcatcg agaatgagct cctgggcttc tttcgcagct cctatgtgct ccacggggag   420
agaagattcc ttggggttac tcagtttcg cct                                  453




<210> 269
<211> 525
<212> DNA
<213> Homo sapiens


<400> 269
ggcacgagaa ctggtgctta atttaatgcc aattcatgat gtaggtttct aagcagcaca    60
taaaaggggc ttttaggta gcactgagta ctttactaaa aatacaaaaa ttagccaggg   120
ggggggtgc acgtctttaa tcccagctac tcagggcggg ggccagggg tggggtaggg   180
tggggctga acaggagaa gcacttgaac ccaggaggcg gaggttgcag tgagctgaga   240
ttgtgctact gtactccaac ctgggcaaca aacagagtga gacactgtct caaataaata   300
```

```
aataaataga taaataaaat aaaataaaat aaaagaact cgaccctttt tacaatagct   360
aaaggaaaat aaaatactta agaatatact taaccaagga ggtgaaagac ctctacaaag   420
aaaactacaa aacactgctg aaagaaatca cagatgacac aaacaaaaac acatcccaag   480
ctcatggaca ggtagaatca atactgtgaa aatgactata ctgcc                  525
```

```
        <210> 270
        <211> 880
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(880)
        <223> n = a,t,c or g
```

```
        <400> 270
cccagtccca cattgagccc tgatcccatc caagtccata gacttggcct ctgaccaaac    60
ctgaccctgc acttgtcact taaggtggtc ccatattcag ctcagaccct gaaccgagct   120
ctgaccctgg cttctgactg aatctgtgac agactaaggc ctgaccctgg ccctatacca   180
cgtctccacc cgtgtcctca actgagtgct gaccccaaac ctagacagcc ctacctgatc   240
cttcccccag gcctgtcccc gccgcttcat ctcaaaagtt gaaggtgagg agccggtaaa   300
caggtctgga gcctggtctc agactcagcc tgagcaagct cagtctgggg tcattgggcc   360
tgtaaccccg ggcaggccct tgttagggat gcagggtctc accctagggg tataagggat   420
ttctgtgccc atcagaactt nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn   480
nnnnnnnnnn nnnnnnnnnn attttgctgt tagcatatgt gatgaccttg acttcacctc   540
cctggcgcca atatcctctt ctgtaaaatg gcttatgcat tacaaagtga ggtcctgcca   600
gtgactacac ctagaggcat taagtgcctt tgtggactcc tgccctgcac ctcacctctc   660
ccagcttttt aaccccctga ggaaccttct taccttgagt ccctcacccg ctacaggcca   720
tccatgagca gatgaactgc aaggagtatc aggaggacct ggccctgcgg gctcagaacg   780
atgcggctgc ccggcggccg tcagagatgt ttaaggtgag gctggctcag ggtcgtggcc   840
tagcatcttt aagttctggg atccagtctg gggtagggag                        880
```

```
        <210> 271
        <211> 1066
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(1066)
        <223> n = a,t,c or g
```

```
        <400> 271
tgaccctcgt aagngcgttg gaattccctc acctgtgtgg tcctcacctt cctgggccac    60
cgcctgctga aacggtttct ggtgccaaag ctgaggaggt ttctcaagcc tcagggccat   120
ccccgcctgc tgctctggtt taagaggtga gtgagctcac agccccgagg cagggcaggg   180
gagggcccct gagctgaggg gttggctcca gggttatggc cagggctgga ggaggaggaa   240
ggctctgtgt catggagaac tctctggcgc cccagggcag gagccagtgg gtggcttcaa   300
```

```
acaaagcagc atctttgtgg tgtttcacca gttcttagtc ccagttacag caggtgactg   360
tggtggacga aaactggact caacagtttc ctccattcag ggatcccagg ccatggagca   420
aggagggccc gaatcagtac ctccctcaga tcacctggac agtgtgagac aaaaagccgc   480
agggaccatc cctggagggg gattcagcag gctcgatcgg ggtccaggtg ctggtatttt   540
tcattagcct ccaggggatt ctgatgtagc cagcagcgtc cttggacaac agtttgagat   600
ctgctgcttt tcaaactgga ttccttggag cgctggaaat ctcagcgatg tcacagggca   660
ggagagggag gttgtggagg gaaaattcag acttcccgcc cagcccacca tttcaccagg   720
cagctctaaa tttatgtgtt ttataagcca aggttcacac aaaaaagaaa attcgctggg   780
gggaaaaaaa cagtttctat ggcttaaaaa aaagtctgaa gaccaccagt ctatttcaat   840
actctatttt gttgatgaag aagctggtga ccaaagatac ccaaagacta agtcaggggg   900
atgcaggggt acaggggtgc ctctcacttt cccaaagtga gatccacata ccacagcaaa   960
atgatttgag ccagcctgtg gatgaacaca tttaaaattt tatttataaa tacatttact  1020
gttacatttg acttctcttt attaaataca tttgtgattt ataaaa             1066
```

```
        <210> 272
        <211> 659
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 272
        tacggggaat tcgtcaccta ccaaggggtg gctgtgacgc ggagccggaa agaaggcatc    60
        gcacacaact acaaaaatga gacggagtgg agagcgaaca tcgacacagt gatggcgtgg   120
        ttcacagagg aggacctgga tctggtcaca ctctacttcg gggagccgga ctccacgggc   180
        cacaggtacg gccccgagtc cccggagagg agggagatgg tgcggcaggt ggaccggacc   240
        gtgggctacc tccgggagag catcgcgcgc aaccacctca cagaccgcct caacctgatc   300
        atcacatccg accacggcat gacgaccgtg gacaaacggg ctggcgacct ggttgaattc   360
        cacaagttcc ccaacttcac cttccgggac atcgagtttg agctcctgga ctacggacca   420
        aacgggatgc tgctccctaa agaagggagg ctggagaagg tgtacgatgc cctcaaggac   480
        gcccacccca agctccacgt ctacaagaag gaggcgttcc ccgaggcctt ccactacgcc   540
        aacaaccacca gggtcacacc cctgctgatg tacagcgacc ttggctacgt catccatggg   600
        gtgagtcgcc tgctggaggc accacctcca ggggctccct ccccaggctc tgggtcttc    659
```

```
        <210> 273
        <211> 412
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 273
        acgcgacttc tcgggtcgac ccacgcgtcc gcacatataa cacatcacgc acctttgag     60
        tggctacctt ggttctcgcc tttcttttca agagaccatt cttcaacaga actgtaagga   120
        ttcttcttgg ctgaatcaga tgtgacgcat cccacttctg cgtttgaggt ctagcacata   180
        ccgctccaag ggctttgacg tcacagtgaa gcactcacac ggaagctgga cgggcttcgg   240
        tggggaagac ctcgccacca tccccaaagg gttgaatact tattttcttg tcaacattgc   300
        cactatttt gaatcaaaga atttcttttt gcctgggatt aaatggaatg gaatacttgg   360
        cctatcttat gccacacttg ccaagccatc aagttctctg gagaccttct tc           412
```

```
        <210> 274
        <211> 522
        <212> DNA
        <213> Homo sapiens




        <400> 274
gaattaagag ttactccggg ccaaatggcc ggagttgtca gatctggcag cgtcttcgct        60
ggggctccag ggagctgctg ctggggtgga agctctcaca ctctttctcc acgtgccctt       120
tccagttccc tgacatcgtg gagttctgcg aggccatggc caacgccggg aagaccgtaa       180
ttgtggctgc actggatggg accttccaga ggaaggtaag gcgtctgatc caggtctgga       240
gctgggattg aggagggcaa gaggcttctg gatgggcaca gagacaccag ctctgggtga       300
ccagggctca gccaccacag ggttacggcc gagctgctca ggccttggct gagccaaggg       360
actccatggt ctgtgcagac tgcgtgccat ctgttgcggc aggtgctttg aattggcaaa       420
gggacagagc cgggcatggt gctctggggg ttgggggaag gactaaggtc agagcaaact       480
ctcctggctt cagtacttgt gaatcagagg gtttaaaaga aa                          522
```

```
        <210> 275
        <211> 650
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(650)
        <223> n = a,t,c or g




        <400> 275
gaattctgct tatgcaccaa tttgcagctc ctgcaaccat gatgcagcct cacccggacc        60
tttcaacatt ttccctttca cctaaaactg tatttttctc tgctaagacc ggctacccta       120
ctttcatttt ccttcactc ttcttggctc ttttgggcct tttaggaatt tgggatgatt        180
caggctctga caggcatggt actagattta ttttaggctg ctcttttgct gttgtccaac       240
aggccaagga gagatttaaa tgatttatcc aatatttgct aaatagtcat gtgtttcatt       300
tatcccatat atagttcagc cttaatattg ttttgtttt gatttgttac actagtgcat        360
acatagagac gtgaagccag aaaatatcct catcacgaaa cattccgtga ttaagctttg       420
tgactttgga tttgctcggc ttttgactgg accgagtgac tactatacag actacgtggc       480
taccaggtgg taccgctccc ctgagctgcn ggtgggggac acgcagtacc ggcccccgg        540
tgggatgttt ggggcaattg gctgtgtctn tgctgagctn gctgtcaggg aagtgcctct       600
ggtggccagg aaaatcggaa tgttggatca gctgtatctg attaggaaga                  650
```

```
        <210> 276
        <211> 497
        <212> DNA
        <213> Homo sapiens
```

```
      <400> 276
cccttgatga ccatctagtc agtgcggtgg aattcccatg acagacgtat ctgactggtc    60
atgtggtcag caagcctcgc ctttggtcag gccctggagg gtacagctga cccatagggc   120
cacttccatg gcactgggca agtggctgta ttggaaatga agtcgttgcc cccgatttct   180
ttggggccag gttgagcttt cctgcccaga gcacggaggc taaagggggt gggctttgga   240
ctggattggg gctgacctca gcctacacct gcaggaggag gtggagacag aggtggcctg   300
ggaggaatgt gggcacgtcc tactgtcact gtgctacagc tctcagcagg gtggcttgct   360
ggtaggtgtg ctgcgctgcg cccacctggc ccccatggat gccaatggtt actcggaccc   420
cttcgtgcgc ctgtgagtga actggggtag gcaggcggga ggtgaggata aggcggtgac   480
tcctcacctc tccaggg                                                   497
```

```
      <210> 277
      <211> 428
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 277
tggtggaatt ctcgccatgg aatatgcacc aggcggcact ctgctgagt tcatccaaaa     60
gcgctgtaat tccctgctgg aggaggagac catcctgcac ttcttcgtgc agatcctgct    120
tgcactgcat catgtgcaca cccacctcat cctgcaccga gacctcaaga cccagaacat    180
cctgcttgac aaacaccgca tggtcgtcaa gatcggtgat ttcggcatct ccaagatcct    240
tagcagcaag agcaaggcct acacggtggt gggtacccca tgctatatct cccctgagct    300
gtgtgagggc aagccctaca accagaagag tgacatctgg gccctgggct gtgtcctcta    360
cgagctggcc agcctcaaga gggctttcga ggctgcgaac ttgccagcac tggtgctgaa    420
gatcatgg                                                             428
```

```
      <210> 278
      <211> 427
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 278
gtccagtgtg gtggaattca ccaggtgtcc ggggcagtgg tagtatctgg gctgctgcag     60
ggcatgatgg ggctgctggg gagtcccggc cacgtgttcc cccactgtgg gccctggtg    120
ctggctccca gcctggttgt ggcagggctc tctgcccaca gggaggtagc ccagttctgc   180
ttcacacact gggggttggc cttgctgtac gtgagtcctg agaggcgtgg gatggtgccc   240
agtgggggtg tatgggggga ctaggggagg gcagaactgc tggtcctatc agattcagca   300
gcgactggaa tagggacata ttttatattt ggaatccaag acttttcctt gattcatctg   360
gtctccttga atttcacact gttttctgct gtcccccaag gtcacttcct attccttcca   420
tgggagt                                                              427
```

```
      <210> 279
```

120

```
        <211> 561
        <212> DNA
        <213> Homo sapiens




        <400> 279
cccagaatga ccgggtcgac ccacgcgtcc gcacccagct atggaggcag ctgcaggaac      60
aacttgtttt accgagaaga aacctacact ccaaaagctg agacggacga gatgaatgag     120
gtggaaacgg ctcccattcc tgaagaaaac catgtttggc tccaaccgag ggtgatgaga     180
cccaccaagc ccaagaaaac ctctgcggtc aactacatga cccaagtcgt cagatgtgac     240
accaagatga aggacaggtg catagggtcc acgtgtaaca ggtaccagtg cccagcaggc     300
tgcctgaacc acaaggcgaa gatctttgga agtctgttct atgaaagctt cgctagcata     360
tgccgcgccg ccatccacta cgggatcctg gatgacaagg gaggcctggt ggatatcacc     420
aggaacggga aggtccccct tcttcgtgaag tctgagagac acggcgtgca gtccctcagg     480
taactactct gtgatcgggg ctctgtgaaa cggttttcct gtttatgacg gtgttgttga     540
aattttgaaa aataccacac a                                               561




        <210> 280
        <211> 792
        <212> DNA
        <213> Homo sapiens




        <400> 280
attttttgatg ccatgtggct acattggttt tagaatacta ataaaatcca ttgctttttaa    60
aataaataaa taaaccccat agcacatcct ccatacaaca tctgttgtcc ctcaagatac     120
aattgttacc actatcatct aaccattatt ttatgataac tttaaaatat caacttggca     180
agaaaatatt ccacaaaaca cactctgcct ttttactttta aagagtcctt ggctacctgg     240
gccaatatta ttctcatttg taggatttag gttccacaga atataaatatg tgccttttttc    300
tgtgttccct gcagatttgc aagtaccatc cctttttggg gccttacttt gcacctccag     360
catctgggaa acaatgtttt cctgttgcag actctctttg gtgcagtcac cctcctggcc     420
aattgtgttg caccttgggc actgaatcac atgagccgtc gactaagcca gatgcttctc     480
atgttcctac tggcaacctg ccttctggcc atcatatttg tgcctcaaga aatgcagacc     540
ctgcgtgtgg ttttggcaac cctgggtgtg ggagctgctt ctcttggcat tacctgttct     600
actgcccaag aaaatgaact aattccttcc ataatcaggg aagagctac tggaatcact     660
ggaaactttg ctaatattgg gggagccctg gcttccctcg tgatgatcct aagcatatat     720
tctcgacccc tgccctggat catctatgga gtctttgcca tcctctctgg ccttgttgtc     780
ctcctccttc cg                                                        792




        <210> 281
        <211> 1047
        <212> DNA
        <213> Homo sapiens




        <400> 281
ggtcttggtt tcaagggatc atatgaaaag tgcccagcag ttcttccagt tggtgggagg      60
```
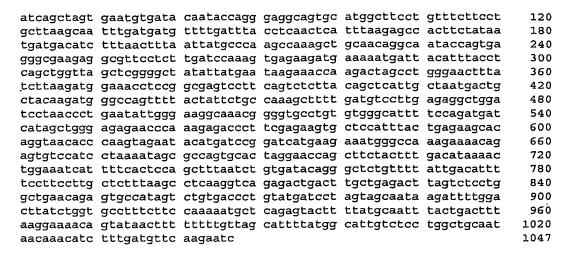
```
atcagctagt gaatgtgata caataccagg gaggcagtgc atggcttcct gtttcttcct    120
gcttaagcaa tttgatgatg ttttgattta cctcaactca tttaagagcc acttctataa    180
tgatgacatc tttaacttta attatgccca agccaaagct gcaacaggca ataccagtga    240
gggcgaagag gcgttcctct tgatccaaag tgagaagatg aaaaatgatt acatttacct    300
cagctggtta gctcggggct atattatgaa taagaaacca agactagcct gggaacttta    360
tcttaagatg gaaacctccg gcgagtcctt cagtctctta cagctcattg ctaatgactg    420
ctacaagatg ggccagtttt actattctgc caaagctttt gatgtccttg agaggctgga    480
tcctaaccct gaatattggg aaggcaaacg gggtgcctgt gtgggcattt tccagatgat    540
catagctggg agagaaccca aagagaccct tcgagaagtg ctccatttac tgagaagcac    600
aggtaacacc caagtagaat acatgatccg gatcatgaag aaatgggcca aagaaaacag    660
agtgtccatc ctaaaatagc gccagtgcac taggaaccag cttctacttt gacataaaac    720
tggaaatcat tttcactcca gctttaatct gtgatacagg gctctgtttt attgacattt    780
tccttccttg ctctttaagc ctcaaggtca gagactgact tgctgagact tagtctcctg    840
gctgaacaga gtgccatagt ctgtgaccct gtatgatcct agtagcaata agattttgga    900
cttatctggt gcctttcttc caaaaatgct cagagtactt ttatgcaatt tactgacttt    960
aaggaaaaca gtataacttt ttttgttag cattttatgg cattgtctcc tggctgcaat   1020
aacaaacatc tttgatgttc aagaatc                                      1047
```

<210> 282
<211> 357
<212> DNA
<213> Homo sapiens

<400> 282
```
ctttaaaagt ttctgatgaa ttagtgcagc aatatcaaat taaaaaccag tgtctttcag     60
caatagcatc tgatgcagaa caagaaccta aaattgatcc atatgcattt gttgaaggag    120
atgaggaatt cctttttcct gataaaaaag atagacaaaa tagtgagaga gaagctggaa    180
aaaaacacaa ggtaagagaa atcacagtac accaaagggt cactgttgat tttgtagcac    240
tgcatatagt aacactctta ctaccacagt tatctcactt cttttgtctt agaatagaaa    300
gagtaatcat ttatttagaa aaacctattt ttgcccggct gcggtggctc atgcctg       357
```

<210> 283
<211> 536
<212> DNA
<213> Homo sapiens

<400> 283
```
ctggggtgcc ccgcaacctg ccttccagcc tggagtatct gctgttgtcc tacaaccgca     60
tcgtcaaact ggcgcctgag gacctggcca atctgaccgc cctgcgtgtg ctcgatgtgg    120
gcggaaattg ccgccgctgc gaccacgctc ccaacccctg catggagtgc cctcgtcact    180
tcccccagct acatcccgat accttcagcc acctgagccg tcttgaaggc ctggtgttga    240
aggacagttc tctctcctgg ctgaatgcca gttggttccg tgggctggga aacctccgag    300
tgctggacct gagtgagaac ttcctctaca aatgcatcac taaaaccaag gccttccagg    360
gcctaacaca gctgcgcaag cttaacctgt ccttcaatta ccaaaagagg gtgtcctttg    420
cccaccttgt ctctgggccc cctttccttc ggggaagcct gggtcgcccc ttgaagggag    480
ctgggacatg gcacggcaat ctttctttcc cgctccactt cgaatggggg aagacc        536
```

```
<210> 284
<211> 440
<212> DNA
<213> Homo sapiens



<400> 284
gtatcttatt tgcggcgctg atctggagtt cgttcgatga gaatatagaa gcttcagccg    60
gaggcggcgg tggttcgtcc atcgacgctg tcatggttga ttcaggtgcg gtagttgagc   120
agtacaaacg catgcaaagc caggaatcaa gcgcgaagcg ttctgatgaa cagcgcaaga   180
tgaaggaaca gcaggctgct gaagaactgc gtgagaaaca agcggctgaa caggaacgcc   240
tgaagcaact tgagaaagag cggttagcgg ctcaggagca gaaaaagcag gctgaagaag   300
ccgcaaaaca ggccgagtta aagcagaagc aagctgaaga ggcggcagcg aaagcggcgg   360
cagatgctaa agcgaaggcc gaagcagatg ctaaagctgc ggaagaagca gcgaagaaag   420
cggctgcaga cgcaaagaaa                                               440




<210> 285
<211> 119
<212> DNA
<213> Homo sapiens



<400> 285
gcgatggaaa tcgtccacga gccgcgcgac ctcgagcgtt acatgcgcga ggccgtgaag    60
gtgtcgaacg attcgccggt gctgctcgac cgcttcctga acgacgcgat cgagtgcga    119




<210> 286
<211> 398
<212> DNA
<213> Homo sapiens



<400> 286
aaacagggga tttaagtgtg tcttttgtgt ttgcaaggca ctaacaccac tcccgtctgt    60
atttaaatgc tgtccccagg ttacgactat ggctatgtct gcgtggagtt ttcactcttg   120
gaagatgcca tcggatgcat ggaggccaac caggttgctt tatacttcgg tcaaatgatg   180
ctggaaggat atattttttt atatatgggg agggagggtt tcaaatgatt ttactttgga   240
aaggtacaag aagtctatct gtggagcata ctgtattcca accatcggtt gtgaggaaaa   300
tctttaaaaa ggctggaaag ctttctctag aaaacttaat gggcacagag tgcatttttaa   360
aagctagagc ccagttgctt ttggactaga ttccaaaa                            398
```

```
       <210> 287
       <211> 1177
       <212> DNA
       <213> Homo sapiens

       <220>                    `
       <221> misc_feature
       <222> (1)...(1177)
       <223> n = a,t,c or g
                    .


       <400> 287
cccacgcgtc cgctcctctg ggggtcaaga ggaccccgcc agccagcagt gggcacgacc      60
gcgcttcaca cagccctcca agatgaggcg ccgggtgatc gcacggcccg tgggtagctc     120
cgtgcggctc aagtgcgtgg ccagcgggca ccctcggccc gacatcacgt ggatgaagga     180
cgaccaggcc ttgacgcgcc cagaggccgc tgagcccagg aagaagaagt ggacactgag     240
cctgaagaac ctgcggccgg aggacagcgg caaatacacc tgccgcgtgt cgaaccgcgc     300
gggcgccatc aacgccacct acaaggtgga tgtgatccag cggacccgtt ccaagcccgt     360
gctcacaggc acgcaccccg tgaacacgac ggtggacttc gggggggacca cgtccttcca     420
gtgcaaggtg cgcagcgacg tgaagccggt gatccagtgg ctgaagcgcg tggagtacgg     480
cgccgagggc cgccacaact ccaccatcga tgtgggcggc cagaagtttg tggtgctgcc     540
cacgggtgac gtgtggtcgc ggcccgacgg ctcctacctc aataagctgc tcatcacccg     600
tgcccgccag gacgatgcgg gcatgtacat ctgccttggc gccaacacca tgggctacag     660
cttccgcagc gccttcctca ccgtgctgcc agacccaaaa ccgccagggc cacctgtggc     720
ctcctcgtcc tcggccacta gcctgccgtg gcccgtggtc atcggcatcc cagccggcgc     780
tgtcttcatc ctgggcaccc tgctcctgtg gctttgccag gcccagaaga agccgtgcac     840
ccccgcgcct gcccctcccc tgcctgggca ccgccgccg gggacggccc gcgaccgcag     900
cggagacaag gaccttccct cgttggccgc cctcagcgct ggccctggtg tggggctgtg     960
tgaggagcat gggtctccgg cagcccccca gcacttactg ggcccaggcc cagttgctgg    1020
ccctaagttg tacccaaac tctacacagg acattccaca ccacacacat acacacaccc    1080
cccaccctcc tgccaattaa acagtagcca ttccccnaaa atnnnnnnnn nnnnnnncnn    1140
nnnnnnnnnn nnnnnctcgg cccccgccta ttcaccg                             1177




       <210> 288
       <211> 100
       <212> DNA
       <213> Homo sapiens




       <400> 288
tgaattttca ttttacaggg aagtgtttgt ttatgtcagg gctcagtgag gtccagctga      60
cccatatgga tgatcacact ctaccagggt attgaagctc                           100




       <210> 289
       <211> 406
       <212> DNA
       <213> Homo sapiens
```

124

```
<400> 289
cggcacgagc ggcacgagag tcagagggtt ttaatttact tgtgaagctc acactattga    60
aactaattgc aatgcttgac tttattttct ttagagtcca agaaagagaa aaacaaggca   120
tagcacaaat cccctctag agtgtcatgt tggttgggta atggattcca gagaccatgg   180
gccaggaaca tcctctgtca gcacttcaaa tgcttcacct tcagaaggcg caccactagc   240
aggaagttat ggatgtactc ctcattcatt cccaaagttc cagcatcctt ctcatgaact   300
tttgaaggaa aatggcttta cccaacaagt gtaccacaag tatcgtcgaa gatgcctaag   360
tgagagaaaa cgcttgggaa ttggtcagtc ccaagaaatg aatacc                  406
```

```
<210> 290
<211> 359
<212> DNA
<213> Homo sapiens
```

```
<400> 290
cccggcagcg gcggcagcgc ggggggccga gacggcagtg cctaccaggg cgcgctgttg    60
cctcgagaac agttcgcggc cccgcttggg cggccggtgg ggacctcgta ctccgccacc   120
tacccggcct acgtgagccc cgacgtggcc cagtcctgga ctgccgggcc cttcgatggc   180
agcgtcctgc acggcctccc aggccgcagg cccaccttcg tgtccgactt cttggaggag   240
ttcccgggtg agggtcgtga gtgtgtcaac tgcggggccc tgtccacacc gctgtggcgc   300
cgagatggca ccggccacta cctgtgcaat gcctgcggcc tctaccacaa gatgaatgg    359
```

```
<210> 291
<211> 954
<212> DNA
<213> Homo sapiens
```

```
<400> 291
cccagatcat cgacatggtg cgttgtggtg gtggtacagc tgtggagtct tacctgtcac    60
agtgtcaaga aatgaagggg atgaacggaa ccaggtgctg accctgtatc tgtggatacg   120
gcaggagtgg acagatgcct acctacgatg ggaccccaat gcctatggtg gcctggatgc   180
catccgcatc cccagcagtc ttgtgtggcg gccagacatc gtactctata caagtactg   240
cctatctggg cccctcctct ctcttacccc tctctagact tgcccttagc tgtggggggtg   300
tagtgatccc ctctccctac cacataacct ggttgccacg ctgccctgga agcttttccc   360
caggaccctt ctaagctgcc aagcactcag cccctccatg cacccccac tttaggctat   420
cccaggccag cccaggctga acgtctcctc ggaacctact gtgtggtcca gggcagatgt   480
ctgaatcaca agggcctctc tagggcacac ttttagctct aagtctctca gggctcccc   540
aagagcctgt ctaagggtct ctttcctcca ggacatagcc ctctggaaca ctgctttatg   600
tctccttgac cagttccgtg tctcccagcc agcacatagc tctgcatatt ttctctgggg   660
cccttctaca agttttgcag atgtccccca agggaagtca ctgtgtgtcc cggagctacc   720
tctgggttct gcagaggcct ttttatacat cctctggcta cgtctgtgtc ccttctggcg   780
ccttcaggca ccacccccttc caggcctcga aaggcagcgg gtctctctag gtgcactcca   840
ccctctgtgt tgctttgttc tgaaaacaag aatcaaatta acgaaaaaaa aacaagcaca   900
agtttatttta tttatttgag acacagcctg ggcaagagag tgagacttca tctc         954
```

125

```
        <210> 292
        <211> 595
        <212> DNA
        <213> Homo sapiens



        <400> 292
tacgcactga ctggtgcgtt ggttattgtc accgggatgg tgatgggaaa tatcgccgat      60
tatttcaatc tgcctgtttc cagtatgagt aataccttca ccttcctcaa cgccggcatt     120
ttaatctcta tcttcctcaa cgcctggctg atggaaatcg tcccgttgaa aacgcagtta     180
cgttttggct ttctcctgat ggtgctggcg gttgccggtt tgatgttcag ccacagcctg     240
gcgctgttct cggcggcgat gttcattctc ggggtggtca gcggcatcac catgtcgatt     300
ggtacattcc tggtaacaca aatgtatgaa gggcgtcagc gcggttcccg cctgttattt     360
accgactcct tcttcagtat ggctgggatg attttcccaa tgatcgccgc gtttctactg     420
gcgcgcagca ttgagtggta ctgggtttat gcctgcatcg ggctggtgta tgtcgctatt     480
tttattctga ccttcggctg tgagttcccg gcgctgtgca gccatgcgac taagttgggt     540
accgccagta gttatcccag tctggacgtt gtacagctac ggacattgaa tgcgt          595



        <210> 293
        <211> 552
        <212> DNA
        <213> Homo sapiens

        <220>
        <221> misc_feature
        <222> (1)...(552)
        <223> n = a,t,c or g



        <400> 293
tcttgaagag ccgctgctga tcaacaccag cttaagcaaa gaacagcgtc gggaaaaagc      60
cctgtcgatg atggcgaaag tcggcctgaa aaccgagcac tatgaccgct atccgcatat     120
gttctccggc ggtcagcgtc agcgtatcgc catcgcccgt ggtctgatgc tcgacccgga     180
tgtggtgatt gccgatgaac cggtttccgc gctggatgtt tcagtgcgcg cgcaggtgct     240
gaatctgatg atggatttgc agcaggagtt ggggctgtct tatgtcttta tctcccacga     300
cctgtcggtg gtggagcaca ttgctgatga agtgatggtg atgtacctgg ccgctgcgt     360
ggagaaggga acgaaagacc aaatcttcaa taacccgcgc catccgtaca ctcaggcgct     420
actttccgcg acgccgcgcc tgaacccgga cgatcgccgc gagcgcatca agctcagcgg     480
tgaactacca agcccactga atccaccgcc gggttgcgcc ttcaacgccc gctgttgtcg     540
gcgnttcggc cc                                                         552



        <210> 294
        <211> 426
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 294
tagcgccacc cttgaacggg tactaaatca ccctgacgaa acgcaagccc gacgcttaat    60
gacgctggaa gatatcgtca gtggttattc caatgtgttg atttccctgg cagatagtca   120
gggtaaaacg gtgtatcact ccccggtgc gccggatatc cgcgagttta cgcgtgacgc    180
cataccgat aaagacgctc agggtggcga ggtgtatctc ctttccggcc cgacgatgat   240
gatgccaggc cacggtcacg ggcatatgga acacagcaac tggcggatga ttaacttgcc   300
ggttggcccg ttggtggacg gcaaaccgat ttatacgctc tacatcgcgc tttcgatcga   360
ttttcatctt cattacataa atgatttgat gaataaactt attatgaccg catcggtaat   420
catcat                                                              426
```

```
        <210> 295
        <211> 340
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 295
gggtgctggc gtatccgggg attaaagtct cgacggcaga agccagggct attttaccgg    60
cgcagtatcg ccgccaggat tgcattgcgc acgggcgaca tctggcaggc ttcattcacg   120
cctgctattc ccgtcagcct gagcttgccg cgaagctgat gaaagatgtt atcgctgaac   180
cctaccgtga acggttactg ccaggcttcc ggcaggcgcg gcaggcggtc gcggaaatcg   240
gcgcggtagc gagcggtatc tccggctccg gcccgacctt gttcgctctg tgtgacaagc   300
cggaaaccgc ccagcgcgtt gccgactggt tgggtaaaat                         340
```

```
        <210> 296
        <211> 281
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 296
cgggcagcag cagcgcgtgg cgctggcccg cgcgctgatc ctcaagccga aagtgctgct    60
gtttgatgag ccgttgagta acctcgacgc caacctgcgt cgcagcatgc gcgacaagat   120
ccgcgagttg caaaagcagt ttgatatcac ctcgctgtac gtcacccacg atcagagcga   180
agcctttgcg gtttctgata ctgtgctggt gatgaacaag gggcacatca tgcagatcgg   240
ctcaccgcag gatctccggg tacggagatt gaattggtaa t                      281
```

```
        <210> 297
        <211> 155
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 297
tggcggtgca ttacctagag cgggtgagaa ttgccgaaca tgcgcataag tttcccggac      60
agatttcagg tggtcagcag caacgcgttg ccattgcgcg ttcgctgtgt atgaagccga     120
aaattatgtt gtttgatgag ccaacgtcgg cgctc                                155




        <210> 298
        <211> 217
        <212> DNA
        <213> Homo sapiens




        <400> 298
gctccctatg acgccgaaaa ttattttgat tatgacaatc tgaataacgg accttctttg      60
cagcactggt ttggcgtcga ttcactgggg cgtgacattt tcagccgtgt cctggttggt     120
gcgcaaatct cgctggcggc gggcgtgttt gccgtgttta tcggtgcggc gatcgggacg     180
ttgctgggct tgctcgctgg atattatgaa ggctggt                              217




        <210> 299
        <211> 568
        <212> DNA
        <213> Homo sapiens




        <400> 299
aggtattctg tctgatcgct gaccttgacc cgatcgatga gcttgtggac ttcccgatcg      60
tttacgcttc tgcgctgaac ggtatcgcgg gtctggacca cgaagatatg gcggaagaca     120
tgaccccgct gtaccaggcg attgttgacc acgttcctgc gccggacgtt gaccttgacg     180
gtccgttcca gatgcagatt tctcagctcg attacaacag ctatgttggc gttatcggca     240
ttggccgcat caagcgcggt aaagtgaagc cgaaccagca ggtcactatc atcgatagcg     300
aaggcaaaac ccgcaacgcg aaagtcggta aagtgctggg ccacctcggt ctggaacgta     360
tcgaaaccga tctggcggaa gctggcgata tcgttgcgat cacgggcctt ggcgaactga     420
acatttctga caccgtttgc gacacgcaaa acgttgaagc gctgccggca ctctccgttg     480
atgagccgac cgtttctatg ttcttctgcg ttaacacctc gccgttctgc ggtaaagaag     540
gtaagttcgt aacgtctcgt cagatcct                                        568




        <210> 300
        <211> 366
        <212> DNA
        <213> Homo sapiens
```

128

```
       <400> 300
caaggcaccc gcgctgaatc tcaaggttcc tccaaagata aaacccgtct tgccttcgct        60
ggcctgaaat tcggtgacta cggctccatc gattacggcc gtaactacgg tgtagcatac       120
gacatcggtg cgtggactga cgtcctgcca gaattcggtg gtgacacttg gactcaaacc       180
gacgtgttca tgactcaacg tgcaactggt gttgcaacct atcgtaacaa cgacttcttt       240
ggtctggttg atggtctgaa ctttgctgct cagtaccaag gcaaaaacga tcgtagcgat       300
ttcgataact acactgaagg·taacggccac ggcttcggtt tctctgctac ctatgaatac       360
gaaggg                                                                 366
```

```
       <210> 301
       <211> 199
       <212> DNA
       <213> Homo sapiens
```

```
       <400> 301
gcgataccta ttccgtttct attccgctgg gagccaccat caatatggcg ggcgcagcaa        60
tcactattac cgtgttgacg ctggctgcgg ttaatacgct gggtattccg gtcgatctgc       120
ccacggcgct gctgttgagc gtggtggctt ctctgtgtgc ctgtggcgca tccggcgtgg       180
cgggggggtc tctgctgct                                                   199
```

```
       <210> 302
       <211> 140
       <212> DNA
       <213> Homo sapiens
```

```
       <400> 302
gccaacgcgc agcaagggct gcccagtggt atcaccctga agctaaataa ccttgtcgat        60
aaaggcctgg ttgatcgtct gtatgcggcc tccagctcgg gcgttccggt taatctgctg       120
gttcgcggaa cgtgttcgct                                                  140
```

```
       <210> 303
       <211> 441
       <212> DNA
       <213> Homo sapiens
```

```
       <400> 303
cgcgcgaatg acgctcatcc ccggcacaca tctgctggaa aacatccaca acatctgggt        60
gaacggggta ggcacgaata gcgcgccgtt ctggcggatg ttgcttaaca gctttgtgat       120
```

```
ggcgttcagc attacgctcg gcaaaattac cgtctcgatg ctctcggcat ttgccattgt    180
ctggtttcgt tttccgctac gtaacctctt cttctggatg attttttatca ccctgatgct    240
gccggttgaa gtacgtatct tcccgacggt ggaagtcatc gccaacctgc agatgctcga    300
cagctacgcc ggtttaacgc tgccgctgat ggcctcggcg accgctactt tcctgttccg    360
caagttaaat atgtcggggc cggacaaggt ggtgccagcc gcgcggatct ccgggtacgg    420
acctagagtt cgtaagcaag a                .                               441
```

```
        <210> 304
        <211> 402
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 304
ctgtgcgaaa tgtttgcgtg atgcggatga atgcccctcc ggggcgtttg aacggattgg     60
tcgcgatatc agccttgacg ctctggaacg ggaagtgatg aaagatgaca ttttctttcg    120
cacgtccggc ggcggcgtca cgctttctgg cggcgaagtg ttaatgcagg cggagtttgc    180
tacccgtttt ttacagcgac tgcggctgtg gggtgtgtca tgcgccattg aaactgccgg    240
agacgcacca gccagcaagc tattaccgct ggcgaaattg tgcgatgaag tgttgttcga    300
tttaaaaatt atggacgcga ctcaggcgcg ggatgtggtg aagatgaacc tgccacgcgt    360
gctggagaat ctgcgtttgc tggtgagtga gggcgtcaac gt                       402
```

```
        <210> 305
        <211> 346
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 305
tacctgttat tgtttgtctg cttccttgtg atgtctctgc tggttgggct ggtgtacaaa     60
tttaccgccg aacgcgcggg caaacagtcg ctggatgatt tgatgaacag ttcgctgtat    120
ctgatgcgca gcgaattgcg tgagatcccc ccacacgact ggggtaaaac tctgaaagag    180
atggatttaa atctctcttt cgatctgcgt gtcgagccac tgagtaaata ccatcttgat    240
gatatttcca tgcaccgact gcgtggcggc gaaattgtcg ccctggacga tcagtacacg    300
tttttgcagc gtatcccgcg cagccactac gtgctggcag ttggtc                   346
```

```
        <210> 306
        <211> 207
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 306
```

```
gttgaattat tcctcagcga tgaaggcgat gatgtggtga ttgaagtcgc cgatcagggc      60
tgcggcgttc cagagtctct acgagacaaa atatttgagc aggggggtcag tacgcgtgct    120
gacgagcccg gtgaacatgg cattgggttg tacttgattg ccagctacgt aacgcgctgc     180
ggtggtgtta tcactctcga agataat                                          207
```

```
<210> 307
<211> 214
<212> DNA
<213> Homo sapiens
```

```
<400> 307
tcgacgccat tatcgccccc gatgccaacg ccctgcccgc tgccgcacaa gccgcagaaa      60
acttgaaaaa tgacaaagta gcgattgtcg gattcagtac gccaaatgtg atgcgcccgt    120
atgtagagcg cggcacggtg aaagaatttg gcctgtggga tgtggttcag caaggcaaaa    180
tatcagtgta tgtggcggat gcattacagt aaaa                                  214
```

```
<210> 308
<211> 129
<212> DNA
<213> Homo sapiens
```

```
<400> 308
tacatcgtag tgacggggaa aacacattgc ggtacgccac ttactaccgt tacaggagac      60
gcaacgcaat cgggttatct gacgctgaac ctgcctgaaa tgtgggaagt gtcaggttat    120
aaccgtgtt                                                              129
```

```
<210> 309
<211> 358
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> (1)...(358)
<223> n = a,t,c or g
```

```
<400> 309
gccggttttg ccgcatcaat ggtgcttagc gatgactcaa cgtaccagtg cgccgactgc      60
aaatctgccc gccgggccag taaggagtac cccagttcat caagaagctg gcttgccact    120
ttcggcaacg cgaccggatt aagcttcaat gactttgtct ggttatttgt aagtgcgctt    180
```

```
aaccgtgcct caataatttt cattttcccc gcgacatcgt tgagctgctg ccgggttttg    240
ctggcattaa tatcgggttc cacaccttca actgaagaag taatcccgtt ctgatatagc    300
tggcgatcgg tcgcgataat ggcgntctgc tctttttcta tttgctgcaa gaccgtgg     358
```


          <210> 310
          <211> 253
          <212> DNA
          <213> Homo sapiens

          <400> 310
```
tggcggcctt cctgagagaa tattgccgag gagtacgcga ctaaacgcta tcgttctaac     60
gtcatcaact gggggatgtt accgctgcaa atggcggaag taccaacctt tgaagtgggg    120
gattacattt acatccctgg cattaaagcg gcgctggata atccgggtac gacgtttaaa    180
ggttatgtga tccatgaaga tgcgccggta acggaaatta cgctctatat ggaaagtcag    240
gaagccagaa cag                                                       253
```


          <210> 311
          <211> 304
          <212> DNA
          <213> Homo sapiens

          <400> 311
```
gctgcaaact gaaattggca gcatggtcta tgcggtgaaa ccaggcgatg gttctgcgcg     60
tgaacaggcg gcgagctgcc agcgtgtgat tggcggtctg gcgaatattg ccgaggagta    120
cgcgactaaa cgctatcgtt ctaacgtcat caactggggg atgttaccgc tgcaaatggc    180
ggaagtacca acctttgaag tgggggatta catttacatc cttggcttta aagcggctaa    240
gtatagtccg ggcacggcgt ttacagtcta tgcgatctcc gggtacggac ctcgaatctg    300
ataa                                                                 304
```


          <210> 312
          <211> 344
          <212> DNA
          <213> Homo sapiens

          <400> 312
```
actctagagg atctgctgat ggcgttagat ggagagcaac atcttcagca acaggtatcg     60
gaaaaagtat tagccgataa tgtgttaatt gcccctggtt ctgttaaacc tgatgcgaca    120
ttctggtcgg ccttaatcca ggatcgctat aacgtgatga cctgtattga aaaagacgcc    180
tgcgtcctgg tcgagcaaga tctgaatagt gatggtcagg cggagcggat cctgtttgct    240
tttaatgatg acagagtcat tgtctatggc tttgactcag acagaaaaga atgggacgcg    300
```

                                   132

```
cttgatatga gtttacttcc gaacgaaata acgaaagaaa aatt                      344
```

```
        <210> 313
        <211> 630
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 313
        agagtcaaat agcagatgca ggaagatgcc aggtgaaaga tgccggggtg gcccagctcg      60
        gctgtccctg ctgcttgacc tgcccactcg ccctcttccc cacccccgac aggtgattga     120
        cttcggatcc gccagcattt tcagcgaggt gcgctacgtg aaggagccat acatccagtc     180
        gcgcttctac cgggcccctg agatcctgct ggggctgccc ttctgcgaga aggtggacgt     240
        gtggtccctg ggctgcgtca tggatgagct gcacctgggc tggcctctct acccccggcaa    300
        caacgagtac gaccaggtgc gctacatctg cgaaacccag ggcctgccca gccacacct      360
        gttgcacgcc gcctgcaagg cccaccactt cttcaagcgc aacccccacc ctgacgctgc     420
        caacccctgg cagctcaagt cctcggctga ctacctggcc gagacgaagg tgcgcccatt     480
        ggagcgccgc aagtatatgc tcaagtcgtt ggaccagatt gagacagtga atggtggcag     540
        tgtggccagt cggctaacct tccctgaccg ggaggcgctg gcggagcacg ccgacctcaa     600
        gagcatggtg gagctgataa gcgcctgctc                                      630
```

```
        <210> 314
        <211> 2285
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 314
        cgccttgtaa agaaacgagt tgagtgtagg cagtgtggga aggccggcag gaaccagtca      60
        acgctgaaga cgcacatgcg aagccacacg ggggagaaac cgtacgaatg cgatcactgt     120
        ggtaaggcct tcagcatagg ctccaacctg aatgtgcaca ggcggatcca caccggggag     180
        aagccctacg aatgccttgt ctgcggggaa gccttcagcg accactcatc cctcaggagc     240
        cacgtgaaaa ctcaccgggg agagaagctc tttgtgtcat ccgtgtggaa aaggctccag     300
        tgagcgcgcc tgctttagag acacaggatg attcagaccg gaaacagacc tcgtgggtgt     360
        aagaggaagc ctctgtgagc tcgcacctta ctgggtgcaa aagaatccac ggaacttggg     420
        agaagtccag ttcctgtaaa aactgggaag acgaggcgtt ctcatcccat aggaggtttg     480
        tgagaactca cgccggggt gaaaatgtac gtctgtagca tggagaagcc ttcagggtac     540
        attcagctct taacaaacac aggaggactt aatggcagct tggcatttaa tgtcaaaatc     600
        caagccgtgg catttaatgt caaaatgact tcagaccact tctagccttc tgggcccatg     660
        agtaataatg agcacactag ggagcatctc tgtaaacaca gtggctgggg aaacccttcc     720
        tagtctcact tgattcctca tgacggaaat cacactaaag agagaaatca gtgaagtaag     780
        gaacgtggaa ggtcatgaat gggccgcaaa ccacggccag ctgcttgtct ttgtatggct     840
        tgccagctaa caatagtggt tccatcttta aggaagaaga atgtttgatg agaaaattt     900
        gtggccaatg aagtctgaaa tacttcctgt catctgcccc tttccagaaa aacttggccg     960
        acccttggtc tacagcacgg gttctcagtc gggcgacgat ttggctgtgt aggcgtcatt    1020
        tggcaatgtc tagagacatt tttggtagtt agaatggggg gaagatactc ctgacttgta    1080
        ataagaagac atcagagatg ctgctaagtc ggctccagca cacaggagcc ccccacaacg    1140
        aagagttagt gcccccaaac gtcactgttg ctgaggttga aaataatcat gcagtcattc    1200
        ctcaattact gcctccagca attcctccat ttttatgaat cttgtgagca cttacgctag    1260
        gagaaatttc ttttacaaaa ctttaaaat acagttagtg ctgataattc ctatgtggaa     1320
```

133

```
atgattccag ccatggtccc ctcacttgag catgtgaata ttctcacgga gagaagcccc 1380
agcgagattt tccggtgaat acgggattgc acttactctt tcatcacgga aacagacccc 1440
cgagagaagc cccaacgaga tttttccggtg aatacgggac tgcacgtact ctatcatcat 1500
gaaaacagag ccccgttcat aaattttttca tctttatttt taaggttata ctcctctaaa 1560
taacccttaa gcctcatcaa gaaaggtttg tttatagtat ttttactata gcttcatcct 1620
tgataacgtc ctaatttcct tctggacaac ctccttgacc aatggcatat tgagatctat 1680
gtgacatgag gatatttctc agtaccactt tgttactggt acctgatgca cacggattgc 1740
gaccagagca tgatgcctcc atcaagtggt aatatgtttg cagcctgctg tccagccaag 1800
agtgacagat acttctagtg acttccccgg tatccactct catcttcttc caatatcaag 1860
agaatccagg ttctgtcaga ttagtaaggt gtgctaatct aaattttaaa aaatctctta 1920
caggttttct tgcagctggt accatccatg tctcacagcc ctggccactg acagatcagc 1980
agatgtcacc acatgggctt ctgagaaagc tcttgaatgg ggatcgttct taaacatgaa 2040
ttcctccctg tatgtttttgt tctttgcttt acttttcacc ttgcaaagag atccagtacc 2100
tagtattgga agatccacct taacgaccgt gcatatgaaa accacagtct aaggaagtga 2160
ctgcagaaag ctcacagcga ccctggcctc ccctgtggcc tctttgagtg tctgcagcag 2220
ccctggactt ccagacttct atcacatgag aaaaaataaa actgattatt ggtttaaaaa 2280
aaaaa                                                               2285
```

```
<210> 315
<211> 1316
<212> DNA
<213> Homo sapiens
```
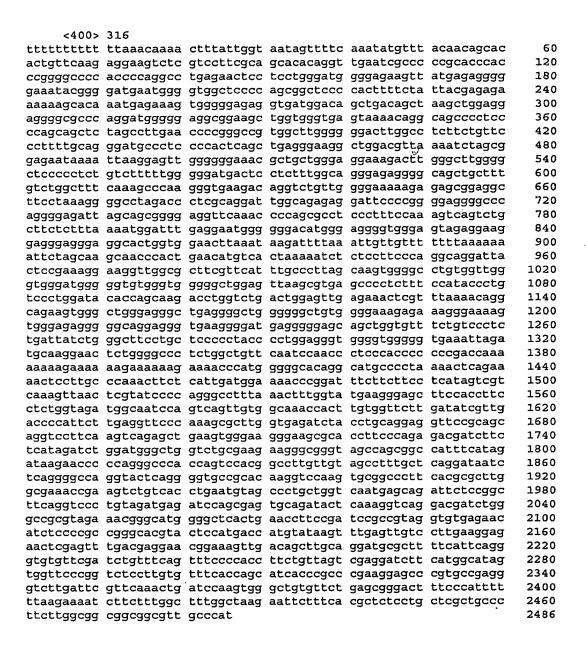
```
<400> 315
ggctgtctat cagtggataa ggtggggggct gtctatcagg ggagaaggtg ggggctgtct 60
atcagtggag aaggtggggg ctgtctgtca gtggagatgg tgggggctgt ctgtcagtgg 120
agatggtggg ggctgtctgt cggtggagat ggtgggggct gtctgtcggt gtagatggtg 180
ggggctgtct gtcggtggag atggtggggg ctgtctgtcg gtggagatgg tgggggctgt 240
ctgtcggtgg agaaggtgga agcttgtact cagagcaggg gatatttaga cttgaagggg 300
ccagggagga aggtactggt tctactaagc cccatgttca ctgggcagcc actaagttag 360
ggaccgtgtg tgtaccgagt ggattccgac aaagaagctg tctcaggagc cccagccagc 420
tgcagagggg ggcccaagct ccaaggctgg gtgtcaggtt tgccaggtgc tggctccgct 480
aggggccgca ggctgcgctg gcgggactg ggctgggctg gtacctgtgc ccggtgtcag 540
gccagctgta gttgcagcgg tcagctgccg ctctctggcc ccatgcgaac tgctgtgcca 600
ggtgcaccct gggggaccag gctgcctggg cttcctggaa ctggtgaagc tgccgccact 660
tcctctatgc tgtctccagc aggcaattct gggtaaacga tcttcatttg cctataaagc 720
tgcacagctc acaggccttg gaccgtttct gccccagccc cagcattggc cctttggaca 780
gactctgaaa ccgtgcgcag aacgcaccct gtcattacaa atgactcctg gaggcagtcc 840
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ttgaacccgg gaggcggaag ttgcagtgag ccgagatcga gacattgccc tccagcctgg 960
gcaacaagag caaaactcca tctcaaaaaa agaaaaaag tgccgagtgg agtcgtcacg 1020
cccgtaatcc tagcactttg ggaggcagag gtgggcggat cacctgaggt cgggagttcg 1080
agaccagcct gaccaacatg gagaaacccc atctctacta aaaacacaaa aattagccgg 1140
gcgtgtgcat gcctgtaatc ccacctactc aggaggctga gggaggagaa tcgcttgaaa 1200
ccgggagccg gaggttgcag tgagccgaga tcgtgccatt gcactccagc ctgggcaaca 1260
agagcaaaaa ctccatctca aaaaaaaaa ggagagagag aaaccgggac cgcaag 1316
```

```
<210> 316
<211> 2486
<212> DNA
<213> Homo sapiens
```

```
      <400> 316
tttttttttt ttaaacaaaa ctttattggt aatagttttc aaatatgttt acaacagcac      60
actgttcaag aggaagtctc gtccttcgca gcacacaggt tgaatcgccc ccgcacccac     120
ccggggcccc accccaggcc tgagaactcc tcctgggatg gggagaagtt atgagagggg     180
gaaatacggg gatgaatggg gtggctcccc agcggctccc cactttctta ttacgagaga     240
aaaaagcaca aatgagaaag tgggggagag gtgatggaca gctgacagct aagctggagg     300
aggggcgccc aggatggggg aggcggaagc tggtgggtga gtaaaacagg cagcccctcc     360
ccagcagctc tagccttgaa ccccgggccg tggcttgggg ggacttggcc tcttctgttc     420
ccttttgcag ggatgccctc cccactcagc tgagggaagg ctggacgtta aaatctagcg     480
gagaataaaa ttaaggagtt ggggggaaac gctgctggga ggaaagactt gggcttgggg     540
ctccccctct gtcttttggg gggatgactc ctctttggca gggagagggg cagctgcttt     600
gtctggcttt caaagcccaa gggtgaagac aggtctgttg gggaaaaaga gagcggaggc     660
ttcctaaagg ggcctagacc ctcgcaggat tggcagagag gattccccgg ggaggggccc     720
aggggagatt agcagcgggg aggttcaaac cccagcgcct cccttccaa agtcagtctg     780
cttctcttta aaatggattt gaggaatggg gggacatggg aggggtggga gtagaggaag     840
gagggaggga ggcactggtg gaacttaaat aagattttaa attgttgttt ttttaaaaaa     900
attctagcaa gcaacccact gaacatgtca ctaaaaatct ctccttccca ggcaggatta     960
ctccgaaagg aaggttggcg cttcgttcat ttgcccttag caagtggggc ctgtggttgg    1020
gtgggatggg ggtgtgggtg ggggctggag ttaagcgtga gcccctcttt ccataccctg    1080
tccctggata caccagcaag acctggtctg actggagttg agaaactcgt ttaaaacagg    1140
cagaagtggg ctgggagggc tgaggggctg ggggctgtg gggaaagaga aagggaaaag    1200
tgggagaggg ggcaggaggg tgaaggggat gaggggagc agctggtgtt tctgtccctc    1260
tgattatctg ggcttcctgc tccccctacc cctggagggt ggggtggggg tgaaattaga    1320
tgcaaggaac tctggggccc tctggctgtt caatccaacc ctcccacccc cccgaccaaa    1380
aaaaagaaaa aagaaaaaag aaacccatg ggggcacagg catgcccta aaactcagaa    1440
aactccttgc ccaaacttct cattgatgga aaacccggat ttcttcttcc tcatagtcgt    1500
caaagttaac tcgtatcccc agggcctta aactttggta tgaagggagc ttccaccttc    1560
ctctggtaga tggcaatcca gtcagttgtg gcaaaccact tgtggttctt gatatcgttg    1620
accccattct tgaggttccc aaagcgcttg gtgagatcta cctgcaggag gttccgcagc    1680
aggtccttca agtcagagct gaagtgggaa gggaagcgca ccttcccaga gacgatcttc    1740
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ataagaaccc ccagggccca ccagtccacg gccttgttgt agcctttgct caggataatc    1860
tcaggggcca ggtactcagg ggtgccgcac aaggtccaag tgcggccctt cacgcgcttg    1920
gcgaaaccga agtctgtcac ctgaatgtag ccctgctggt caatgagcag attctccggc    1980
ttcaggtccc tgtagatgag atccagcgag tgcagatact caaaggtcag gacgatctgg    2040
gccgcgtaga aacgggcatg gggctcactg aaccttccga tccgccgtag gtgtgagaac    2100
atctccccgc cgggcacgta ctccatgacc atgtataagt ttgagttgtc cttgaaggag    2160
aactcgagtt tgacgaggaa cggaaagttg acagcttgca ggatgcgctt ttcattcagg    2220
gtgtgttcga tctgtttcag tttccccacc ttctgttagt cgaggatctt catggcatag    2280
tggttcccgg tctccttgtg tttcaccagc atcacccgcc cgaaggagcc cgtgccgagg    2340
gtcttgattc gttcaaactg atccaagtgg gctgtgttct gagcgggact ttcccatttt    2400
ttaagaaaat cttctttggc tttggctaag aattctttca cgctctcctg ctcgctgccc    2460
ttcttggcgg cggcggcgtt gcccat                                         2486
```

```
      <210> 317
      <211> 867
      <212> DNA
      <213> Homo sapiens
```

```
      <400> 317
tttttttaa gtttatataa ctttattata agtattaatt tgtttgaatt aagtttatat      60
aactttaata taagcattaa tttgtttgaa atataaagta ttataaaata ttgtaattaa     120
```

```
gcttacagat  aattttaaa  atatatacat  tatgactaat  ataccaaaat  tatttatatg   180
tacacattta  tatttaatac  ccaaagaaaa  tttactacca  cattgctaca  gtagatatta   240
acctgacatg  tttattaatt  gatcctatag  gtataattat  aggtcagcat  aattttacag   300
tctattcttt  tattttacta  aattaggaat  gccactattc  ccggacaaat  aaatgcaggt   360
gatgtggcca  cccaagaatc  atagtagctc  ttcagttagc  tatcttgcaa  tctctgatat   420
aattctacta  tgtgaataga  gtgaattcca  attcttcatc  aaaaagtgct  ggtggaggtt   480
gtcaggtgtg  ttccagtata  gattcccaat  ccaacggccg  gcagatggga  gagcagcaga   540
gatggaaatt  gtgctcagaa  taagccctct  ttctcataat  acttgtattt  ctcatgctga   600
gagtagctgt  gcacttttgg  tgtttagaga  agaacttctt  tggaagaata  ttttctggtc   660
aatttgacca  atgttacatg  taatctgaat  tagtctgtaa  gattctttca  acctcttttc   720
ttctctcaat  acggttttac  tcagactgag  agctgtcttt  ctcttcaatg  ctttgggaat   780
tcagtgcttt  gtgtctaagc  ccctattagt  atcacatggt  gtctgtgagt  gagggggggct   840
gtcaccgtga  gaactcctgg  agctgct                                          867
```

```
        <210>  318
        <211>  1683
        <212>  DNA
        <213>  Homo sapiens
```

```
        <400>  318
ggcacgaggt  aggaaccagt  ggtctatgtc  ccgaccacta  cttggcttga  tagggcttaa    60
tgaaaaggtg  agagagccag  ctccctggtg  ccaacccaga  agcagtggca  accacgcact   120
tggtatcacc  aagccctggg  agaaatgtgt  atagaaacac  cccacggtgg  tgaaacaggg   180
aaaatgggtc  atttactgag  caagtcccat  ttgtgctttc  agtatcacat  aatcatttaa   240
ctgttagaag  tcagcatgtg  tggtagctca  cagacacagg  ataaaggagt  gtttccccta   300
ggcagtaaga  gaaacctttc  aaggaaataa  tgtacctggg  tatcagagga  cctaagacct   360
aagttctagt  tctagctctg  ctataaacaa  gtcttgagat  tctggtaaaa  gaaaggtctg   420
gataagatga  ccctttttaaa gtgctttaca  atttaaaaat  tcttgatatt  cttagtagga   480
tgaagccata  ttatcccaca  agtgcttgcc  tgaatttctt  ttttaagggt  ccaattttag   540
tagacattcc  attcctcctt  agagaagaac  attcttcaac  cctgcagatg  acggagggct   600
aatctgcctt  cccctgcttc  tctaaccttc  tgttccactc  cttgccccac  agtattttc    660
tgacctaaga  aacagtattg  tgaacagcca  gccaccggag  aagcagcagg  ccatgcacct   720
gtgttttgag  aacctgatgg  aaggcatcga  gcgaaatctt  cttacgaaaa  acagagacag   780
gtgagtataa  agcgtcctgc  ctagaaatct  cagacaattg  ctattttca   aatcaacgaa   840
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taacccattg  tatctaaaat  attgtatcag  tgtgtaatca  gtattttaaa  attgtgggtt  1020
ttcacattct  ttttgtacta  catttccaaa  atcctgtgta  ctttacattt  aacagcatat  1080
ctcagttcat  acgtttcat   cagaaatact  tgatctgtat  ttagatttca  taaatttaca  1140
gttgacaaag  tagattcctg  taatacccag  attgtttcaa  acacacctag  ggactttcca  1200
gtaactgcat  tgagtatctg  ggctttgcaa  ttaactttta  aattttattt  aatttttaatt  1260
aatttaaaac  aaggcatttt  aatttaaaat  taagatgcag  ttggggagct  gaatgttaaa  1320
ttgtatttaa  tttggattca  tgttctcagt  cacactggcc  ataattcagg  ggcacggtag  1380
ccatatgtgg  ttaggcagcc  gccctattgg  gacaggcata  gcactgcacc  acctgggtct  1440
tgctggcatt  aaggaaatga  ggatgggctt  cattgggctt  tactggccct  tcacgtgtga  1500
gggcaacttc  ctacttctgt  cagtgagatt  tcttttgtgc  tgccatgagc  ccaaggtagc  1560
cctcagggcc  ccagatttga  ccagatctct  aagccaactt  ttctcttaga  gtcttaagac  1620
tgaaattaac  tgatctttga  aacagaaccc  atcaattcat  acattctact  tcccatgctt  1680
taa                                                                     1683
```

```
        <210>  319
        <211>  1606
```
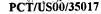
<210> DNA
<213> Homo sapiens

<400> 319
```
tttttttttt ttcgtatttc aagggttttt attctgagca gtaggtacaa aaaataatga    60
catagttgtg tctaattctg tatagttcag gcaccctcca caggctgtca atctctgatt   120
tgatctactt ttaccagatt taacagatcc ttgaatttac tttactgtat atacttcctt   180
cttgctcaca ttgggaatca aactaatgct ggaaacatgc atcttcagac ttcattgagg   240
aattccagat tgagacacgc tgggatgtgg attgagtcca tggttagaga agatggatta   300
aatggaaaca aaacaggaaa catgtgcttg gcatctaata gcagttgctg agggtcattc   360
cgctcttgta gttgtgcctg gattgttcgt ataaaggcca ctgttacccg ttcttcaaat   420
tcattcaggg gagtataaag gtttaaaatt ttgacaatct gctgggtgct gagggaggta   480
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aaggcattca tctggcggat gatagcttcc aggcggtatg agttatcctc atctgccatg   840
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gcttttgag cttcctctca ttcttttcca gcttttctac cagttcttta aggtccagat  1560
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```


<210> 320
<211> 676
<212> DNA
<213> Homo sapiens

<400> 320
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ttgatgccca gcaactggcc tgtgacccc tacttgctgc attatatcca aaaattggtc   180
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tcttcgaatt gagactgact ccaaggccac aaactgttca acacacacaa agtggacaaa   300
tagcatttag cagcaggttt ggaacgtaga gaatctgaat ggatctgatg aaacctgaac   360
caggtgctta tttttgttgct tttttcccat ccactgagca tgacagcatg gattctcttt   420
aaggagaaac catgggcagc tccagccagg cctcatagga aaaggcccgg catgaggttc   480
tggcgtcaat ggccactgtg tatggctgct ctgagtgagg aaaaaactaa aaagaaaaac   540
tggttccatg tactgtgaac ttgaaaacat gcagactcac gggggttcct gatgcaatgc   600
ttcagatgaa gattgtggac ttgaaaatac agactagaag gccgggcaca gtggctcatg   660
cctgtaatct cagcac                                                   676
```

```
<210> 321
<211> 1502
<212> DNA
<213> Homo sapiens




<400> 321
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aaaacaatat aaccaaaaat tcatttgttc cctttgttta ggggtgtttt acatttatgc    180
ataattttgc ttttataaaa gatgattgtt acaatcaggt atacaactac ttggttatgt    240
ctaagttctg tctcttaaaa tatgttcttt tagagaattc atttaatcat cttattcttt    300
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gtttttggcc acacccagat catactgata tctacagcat agtcctggct acaggggagc    420
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gtttaggtac atccaaaatt tcttcatagt ctgcactcat tccctttgcc cagcgaccaa    600
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atctagacag gtgccccatt tctccacaaa caaaacattt tgcaaaagga aattcgccaa    780
gagccgggtc tactttagcc ttacacttgg ttatttcgtg ctctgtggac ccacacctgt    840
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caggcaaggg tctcttgtta tatgtggtac taactcgggc ccacctggtc ataatttcat    1320
cagtggtacc ttatcaattt ttaagacaag caggggtggt tagccatcaa caacaaaaac    1380
aacaaaacta aagagacatg ctatatcact atatgtcaca tatgcccata tgttaaactt    1440
ttaattatta aaacactttt tatttcagtt agatatctgt atacatattt aatggctata    1500
at                                                                   1502




<210> 322
<211> 989
<212> DNA
<213> Homo sapiens




<400> 322
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acaggcgcac gccaccaggc ccggctaatt tttttttttt gtattttag tagaaacggg    180
gtttcaccgc gttagccaga atggtttcta tctcctgacc tcatgatccg cccacctcgg    240
cctcccaaag tgctgggatt acaggcgtga gccactgtgc ctggccaaac gctggtaggt    300
ttgggagtga gaccacatta catttaaata tatttacaat gttttctgct ctattcttta    360
gtagactttt cctcacgtgg tcctacgcat ttcttctaa gtttatttttc atatagccta    420
tccctgtcta caatttaaat gggatcttc tatattctag ttattatttg taaataagaa    480
aactactgac tttttctag tatattttct cagaatagga ttttctattt ttctataaaa    540
tgaccaatgt tatgaagctt cgtaagtttt gtcaaagtga tacacacata cagcaaaaaa    600
```

```
tcaaatagta cagaagtata aaagcaacaa cctctgcctt gccccttctc caccttcagg      660
tccccttccc agatacaata attttttagct ttttattttt aattattctg gttgttacct    720
acataactct gggcaatatg gaaaagttat tgattttgta tattaatttc ataatcagtt      780
accttgatga attctcttgt ttctagtagt ttttctttag ggttttaaag ggatacaatc      840
ataccatttg cagttagtaa ccattttatc tcctcttatt tccaacttcg tactgttttc      900
tcttgtctaa tttgtttttta attggtgggt acttctagaa caaggttaaa taaaagtggt      960
gttggtgggc gtccttattt ctgatatta                                        989
```


        <210> 323
        <211> 1106
        <212> DNA
        <213> Homo sapiens

        <400> 323
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ttatctgtct gttttggggc tggtttattc gtctttgtct tgaaacgccg aaagggagtg      180
ccgagcgttc ccaggaatac caacaactta gacgtaagct cctttcaatt acagtatggg      240
tcttacaaca ctgagactca cgataaaaca gacggccatg tctacaacta tatcccccca      300
cctgtggtac agatgtgcca aaaccccatc tacatggcag gaagggaagg gagacccagt      360
agcctattac cgaaacctgg caaggagttt cagctattag gcaacctgga ggagaaaaaa      420
gaagagccag ccacacctgc ttacacaata agtgccactg agctgctaga aaagcaggcc      480
acaccaagag agcctgagct gctgtatcaa aatattgctg agcgagtcaa ggaacttccc      540
agcgcaggcc tagtccacta taactttgt accttaccta aaagggcagt ttgcccttc        600
ctatgaatct cgacgccaaa accaagacag aatcaataaa accgttttat atggaactcc      660
caggaaatgc tttgtggggc agtcaaaacc caaccaccct ttactgcaag ctaagccgca      720
atcagaaccg gactacctcg aagttctgga aaaacaaact gcaatcagtc agctgtgaag      780
ggaaatcatt tacaacccta aggcatcaga ggatgctgct ccgaactgtt ggaaacaagg      840
acattagctt ttgtgtttgt ttttgttctc cctttcccag tgttaatggg ggactttgaa      900
aatgtttggg agataggatg aagtcatgat tttgcttttg caagttttcc tttaaattat      960
ttctctctcg ctctcctctt cccactccca cactgaaaaa caaagaagaa aaaagaaaca     1020
aaaccataaa caaaatctat gaagaaatgc attgtagaaa cattcatgtc cactgatggt     1080
tcctaagaag agaagggaaa aagaaa                                          1106
```


        <210> 324
        <211> 2366
        <212> DNA
        <213> Homo sapiens

        <400> 324
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gacgagtggg aggtgctgct gatctccctg caggggcacag cgccattcct gcatgtgggg      180
gctgtggcag cagtcaccat gctctcctgg atcgtggcag gacagttcgc ccgtgcagag      240
cggacctcct cccaggtgac cattctctgt accttcttca ccgtggtgtt tgccctctac      300
ctggccccctc tcaccatctc ctctccctgc atcatggaga agaaagacct cggccccaag      360
cctgctctca ttggccaccg cggggcccccc atgctggctc cagagcacac gctcatgtcc      420
ttccggaagg ccctcgagca gaagctgtac gggctccagg ctgacattac catcagcctg      480
```

```
gacggcgtgc ccttcctcat gcatgacacc accctgcggc gcaccaccaa cgtggaggag    540
gagttcccgg agctggcccg caggcctgcc tccatgctta actggaccac cctgcagaga    600
ctcaacgctg gccagtggtt cctgaagact gacccctтct ggacagccag ctccctgtca    660
ccctccgacc acagagaggc ccagaaccag tccatctgca gcctggcaga gctcctggag    720
ctggccaagg gcaatgccac actgctgctc aacctgcgtg acccgccccg ggagcacccc    780
taccgcagca gttttatcaa cgtgactctg gaggccgtgc tgcactccgg cttcccccag    840
caccaggtca tgtggctgcc tagcaggcag aggcccctgg tgcggaaggt ggctcccggc    900
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caagggcctg ggccgagcct ctacctgaag caactctgct cttcctgtca gtctcaaagc   1980
acaaggaggt tcagcccagg aggaagccag ctgcaatgtg gagacacgtc ctcctcccca   2040
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tggcccaggg tgggtgtgtg gctaagtggg cctgaacaga gggaaccctа gggcccttgg   2340
ccaatgtgat taaagctgcc atcttg                                       2366
```

```
<210> 325
<211> 1925
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(1925)
<223> n = a,t,c or g
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```
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tctctgtata aagtgattat agagatgtgt gttgaggtaa acagcttcat aaaaaccgtt    120
gagcagggaa gcacagccac tgctatagaa attttaggt aagtctggtg ctagcattat    180
tctacaaaac tgtttacacc cattataaat aggggacagt tcttattgct cctggagctt    240
gtagctccaa tctgttccag ctccactgaa aaatgattтt tctcaacaat tggtagcaaa    300
gatttccaaa tttacaaaaa gtcattacca atgcatcact ttttgattaa tttctgattg    360
ccatatagat atggactaca gtatgcatgt ccttgacacc aagtacagaa aaaaagctta    420
gaaaagtcgt tttatcaaag ttcagttcaa tgagaaacat gaaaaagtgc aaaatatgta    480
caattcctgg cagttctcac acgggatttt tttgactaca gaccataaaa gtttacattt    540
gtgtaatgaa atgacgatgg atttcacatc actgttaata tacaagtttt tgcttcaaag    600
tgcttacttt atttataaaa gagaagatca agagggttgc aggaattttt tttttttaac    660
aacaaatcaa tggtatgtgt cccaatctcc ttcttcctct tcctttagtg caacatggcg    720
```

```
cagcagcctc atggataagg tctgatttca aaagacattc ctgaaacctc acctacagca      780
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ttcgagattt tactactttc attctcacct caaaaacttc atgaatggcc ttccggaagc      900
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tgatggctgt ggattccttg tcataggggg ttcctgctcc atcttctttg agaccataaa     1080
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ggagcctggc cagggcttcc atgtaatcat cctgtgagtc aatgacaaat atcagtgctc     1560
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ggaagtccca aatctgaaaa ttgacaaagg agctgttgga aacatcttcc cggcatatct     1680
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gaatagacga cttgccgctt ctcctcaggc ccatgagcag gattctcggc ttcacttcag     1800
tgctgaaggg gtcactgaag tccagaactc cctcctctgt gccgctgtcc ggatcggcgt     1860
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tccca                                                                 1925
```

```
        <210> 326
        <211> 1181
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 326
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        ttcccgtatc agagaaggaa cagcccaagc tatgacccca gggccaggga attcagtccc      120
        caccagaccc tgtcattcca tcactagggg gtaattccag gctccccctg ccagccctga      180
        gacaggagga cggatgtgaa gttgcccagg actagattct gtctctccaa agtgggccaa      240
        gccctgttct ctgtactagg gaagccagct gtgtcttttc gaggacagtt ggtccagcca      300
        gcaggctcag ttcagatacc agacaaccat tccagcacga gggctcagcg ccctggcccc      360
        ggcggtcgct ccagtgcctg tgtgcccacc agcacatcca tgaggtagtc caattcggcc      420
        tcgtccagct ccggagcttc ctccttgccc ggcccatcct cagggcctgg tttgaggccc      480
        tcagaggctg gtgcccaaag ttcattgtca tacatagagg tgtcaatatc ctcaaacagg      540
        ccctcaagcc catcgtccag tagacagcca gtggctgggc ccagcaggtc caaggcaccc      600
        aggctgggcg ctgctccccc gatgctacgg cctggtggcc cctcgtctgc caagggttgg      660
        ggagcctgac tcaggccctc aatgtggctg aggtcctcca ggaggctggc catggaggct      720
        gaaagggcag cgtccgagct tgccagtaag ttgtcagcca cactggggc tgcaggtggg      780
        ctaggcacag gtggcagggc agccgcgggt gccatggacg cctggatgcg ccgcagagtg      840
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        cgaagaggta gccacccaca accaatcagg aaacggcggc ggcagcatcg cttgttggct     1140
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```

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        <210> 327
        <211> 1842
        <212> DNA
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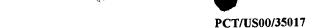
<213> Homo sapiens

<400> 327
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aagtacaaaa taatattta ataacatagg aacatgaaca tgaaaacaat gtaaacaggt     60
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aatttctatg gcaaaaggat taaccaaggc atatcatagg aaatccactt tgcccaatat    180
aagcagttct cagcacatac tcaaatgcac acaaacatga aaatcggaaa taaaggaatg    240
ttaaaaaaat aacttaggca gacacaaata aaaccacccc actagtgtat gaatgatgcc    300
acgtttctta tgatcttaat tacatttaag gatttaaaaa atgccactga tctcacagtt    360
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gcagcatgag tcttttttcag ctctattttc atcttttctg attcagcctt cagtttattg   1020
acgacaatct catgttccct tgtagccctt tgcttttcct cttcacgaag aagaccaagc   1080
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<210> 328
<211> 1293
<212> DNA
<213> Homo sapiens

<220>
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<223> n = a,t,c or g

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        <211> 1734
        <212> DNA
        <213> Homo sapiens
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        ttctaagggc aatacagcca aaaatggtgg cttgcttctc agtaccaata tgaagtgggt      180
        acagttttca aacctacacg ttgatgttcc aaaggatttg accaaacctg tggtaacaat      240
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        ggctgtattg dacagttatg aatattttgc tgtgcttgct gctaaagaac ttggtatctc      360
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        caaaccactt tgactgaaag cagaaagagt gaaaattcta ttttgttacg ctactggtgt      960
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        ggctgaggca ggagaatcgc gtgaacccgg gccggtgga ggctgcagtg agacgagatc     1680
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<210> 330
<211> 2105
<212> DNA
<213> Homo sapiens



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<210> 331
<211> 5654
<212> DNA
<213> Homo sapiens



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145

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<212> DNA
<213> Homo sapiens
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```
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<211> 1759
<212> DNA
<213> Homo sapiens
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<212> DNA
<213> Homo sapiens

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<211> 865
<212> DNA
<213> Homo sapiens
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<211> 1126
<212> DNA
<213> Homo sapiens




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<210> 337
<211> 4280
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)...(4280)
<223> n = a,t,c or g
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<211> 1796
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        <213> Homo sapiens




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        <212> DNA
        <213> Homo sapiens




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accggtcatg tgacccttcc agcagcacag cccttaaatg tgggtgtggc ccacgtgatg   1680
cggcagcagc caaccagcac cacctcctcc cggaagagta agcagcacct gtattgcggc   1740
cgcgctagag tatccaagat tgcgtctcgc t                                  1771
```



```
<210> 340
<211> 2725
<212> DNA
<213> Homo sapiens
```



```
<400> 340
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agaagaaggg gatggagcct ggtgccctga gattccagtg gaacctgatg acctgaagga    180
gtttctgcag attgacttgc acaccctcca ttttatcact ctggtgggga cccaggggcg    240
ccatgcagga ggtcatggca tcgagtttgc ccccatgtac aagatcaatt acagtcggga    300
tggcactcgc tggatctctt ggcggaaccg tcatgggaaa caggtgctgg atggaaatag    360
taacccctat gacattttcc taaaggactt ggagccgccc attgtagcca gatttgtccg    420
gttcattcca gtcaccgacc actccatgaa tgtgtgtatg agagtggagc tttacggctg    480
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tggaggttcc atcatttatc tgaatgattc tgtctatgat ggagctgttg gatacagcat    600
gacagaaggg ctaggccaat tgaccgatgg tgtgtctggc ctggacgatt tcacccagac    660
ccatgaatac cacgtgtggc ccggctatga ctatgtgggc tggcggaacg agagtgccac    720
caatggctac attgagatca tgtttgaatt tgaccgcatc aggaatttca ctaccatgaa    780
ggtccactgc aacaacatgt ttgctaaagg tgtgaagatc tttaaggagg tacagtgcta    840
cttccgctct gaagccagtg agtgggaacc taatgccatt tccttccccc ttgtcctgga    900
tgacgtcaac cccagtgctc ggtttgtcac ggtgcctctc accaccgaa tggccagtgc     960
catcaagtgt caataccatt ttgcagatac ctggatgatg ttcagtgaga tcaccttcca   1020
atcagatgct gcaatgtaca acaactctga agccctgccc acctctccta tggcacccac   1080
aacctatgat ccaatgctta aagttgatga cagcaacact cggatcctga ttggctgctt   1140
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gcagaaaatg ctggagaagg cttctcggag gatgctggat gatgaaatga cagtcagcct   1260
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caggctgata cgaaaactcc agaatttgc tccaggggag gaggagtcag gctgcagcgg    1440
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catagtgaac ctccaaggag tgacaggagg caacacatac tcagtgcctg ccgtcaccat   1560
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aactttcaaa gagaagctgg gagaaggaca gtttgggag gttcatctct gtgaagtgga    1680
gggaatggaa aaattcaaag acaaagattt tgccctagat gtcagtgcca accagcctgt   1740
cctggtggct gtgaaaatgc tccgagcaga tgccaacaag aatgccagga atgattttct   1800
```

```
taaggagata aagatcatgt ctcggctcaa ggacccaaac atcatccatc tattatctgt    1860
gtgtatcact gatgaccctc tctgtatgat cactgaatac atggagaatg gagatctcaa    1920
tcagtttctt tcccgccacg agcccctaa ttcttcctcc agcgatgtac gcactgtcag     1980
ttacaccaat ctgaagttta tggctaccca aattgcctct ggcatgaagt acctttcctc    2040
tcttaatttt gttcaccgag atctggccac acgaaactgt ttagtgggta agaactacac    2100
aatcaagata gctgactttg gaatgagcag gaacctgtac agtggtgact attaccggat    2160
ccagggccgg gcagtgctcc ctatccgctg gatgtcttgg gagagtatct tgctgggcaa    2220
gttcactaca gcaagtgatg tgtgggcctt tggggggttac tttgtgggaa aactttcacc    2280
ttttgtcaaa gaaaaggccc ctattcccca gctgtccaga tgaaacaggt tattgaagaa    2340
atactggaga gttcttcccg agacccaagg gagggcagac ttacctcccc tcaaccagcc    2400
catttgtccc tgactcctgt gtaataaagc tgatgctcag ctgctggaga agagatacga    2460
agaaccgtcc ctcattccaa gaaatccacc ttctgctcct tcaacaaggc gacgagcgat    2520
gctgtcagtg cctggccatg ttcctacggc tcaggtcctc cctacaagac ctaccactca    2580
cccatgccta tgccactcca tctggacatt taatgaaact gagagacaga ggcttgtttg    2640
ctttgccctc ttttcctggt cacccccact ccctacccct gactcatata tactttttt    2700
tttttacatt aaagaactaa aaaaa                                          2725
```

```
          <210> 341
          <211> 916
          <212> DNA
          <213> Homo sapiens
```
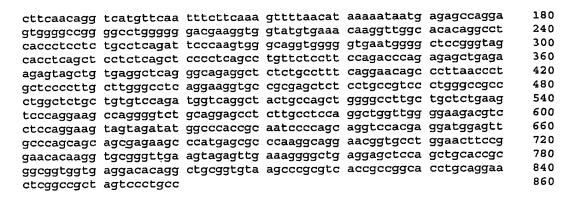
```
          <400> 341
cgtccaggga gcactgccca caggccgagc cggggcctcc cgcaagagga aggaggtgcc     60
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ggccgagagg gcctcgggga cccagtgcat gccccacgct gagcagcaca ggctgcccca    180
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cgccaggccc agggccacca cagtggaagg tctccccttc cccaggcacg taatcttcca    300
ggtcagccag tgtcagcatg cggccgttgt gcgtgaggat cttggggtca cgatccccaa    360
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ctcccgcctc ctccatggtg ccctcctcct ccaggctgcc catgccagaa gcagcccagt    480
ccacactgcc tctggcatcc acgcggaaga caaggggctc tctgacgccg accatggctg    540
tgccctgggc ccaggcctcc tgggccagca gcttgttgtt ggagttgttg gaattggggt    600
cccctccggg ggtcgcaccg ggcagtgtga agagatgccc cgatgagctc ctggcacct     660
ctgtggtggg agacacaccc tgcgggccca tcttcttcac ccggacttca atggtctcct    720
ccacctccac ccacttgggc tggggccccg agagtccggg cagagctgga gagtgggcct    780
cggcctccgt cacatacagt gtgggcacca cgggcttctg gcctggttct gcctccggcc    840
tgcggggctg ccagcacct ggcaggtaca gcaggtcggg ggccagtagg cctggcctca    900
gcgggctggc agagca                                                    916
```

```
          <210> 342
          <211> 860
          <212> DNA
          <213> Homo sapiens
```

```
          <400> 342
caagatcccg acaggcttaa tcgctccctt aaggaaaaag ttattccttg catccgcggt     60
aaacttgggc cccccaagg atcctttaaa cgggccgccc cttttttttt tttcaattt      120
```

153

```
cttcaacagg tcatgttcaa tttcttcaaa gttttaacat aaaaataatg agagccagga    180
gtggggccgg ggcctggggg gacgaaggtg gtatgtgaaa caaggttggc acacaggcct    240
caccctcctc tgcctcagat tcccaagtgg gcaggtgggg gtgaatgggg ctccgggtag    300
cacctcagct cctctcagct cccctcagcc tgttctcctt ccagacccag agagctgaga    360
agagtagctg tgaggctcag ggcagaggct ctctgccttt caggaacagc ccttaaccct    420
gctcccttg cttgggcctc aggaaggtgc cgcgagctct cctgccgtcc ctgggccgcc    480
ctggctctgc tgtgtccaga tggtcaggct actgccagct ggggccttgc tgctctgaag    540
tcccaggaag ccagggtct gcaggagcct cttgcctcca ggctggttgg ggaagacgtc    600
ctccaggaag tagtagatat ggcccaccgc aatccccagc aggtccacga ggatggagtt    660
gcccagcagc agcgagaagc ccatgagcgc ccaaggcagg aacggtgcct ggaacttccg    720
gaacacaagg tgcgggttga agtagagttg aaaggggctg aggagctcca gctgcaccgc    780
ggcggtggtg aggacacagg ctgcggtgta agcccgcgtc accgccggca cctgcaggaa    840
ctcggccgct agtccctgcc                                                860
```

<210> 343
<211> 3658
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(3658)
<223> n = a,t,c or g

<400> 343

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agcttcagta aaatagagaa ttgtctagaa aatacaatct ccaaaatgtg tgcaagtact    120
gcaaaccgga cagaccgggg cagggcaagg cccttgaaac caagtcctcc ttgagcacct    180
ttcccaggtt agaaaccct cttcagcctg tgcttcgcac gtttccttca gcgtgccgcc    240
cattcagact gcgccaactt acgtccccag tgcccacgcc tgngtggatc aagtgtccaa    300
cgggaaagta tgagttaggg caagcgcttt tttttaagc tgtaaacgct tcacatgact    360
gggccccgta aggaaattgt ggggagctta ggatgagcct gggagctttt tcagggactt    420
ggatgaggac tctgtacaca aatgtgtact ggcagagagt ctgcaccagc atcattctct    480
gttgccctca gcatgtccag cactctcggg atgtccagca cctcattgtg ttccaggcag    540
gcgatcatga tctccgacaa aatcaccacg ccagtccttc ctaccccagc actgcagtgg    600
accaacaacg gagggttggg gctttgggga tcacttgtgc tatttgtatg gcgtcgaaca    660
gactggatct cttcaagata tgataaaaat cccttgaggt cttctggaca gccatgttca    720
ggccagtctg tgtattggag gtgccagacg gtcctctctt gcccggtaag gaggtgcttc    780
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aaccttccat aggtgacagt gttgtgcctg gaaccaagtc gtggccagta cctaaagctc    900
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gcatctactc gagtcttttt cattcccct agaggcggga gcccttccac gatgttcttc   1440
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cggcctgacg tggtgaggtc ggactccgac atggagggca tcagcagccc gtctctccag   1560
ggccgctggg cctctgcggt cgtgcggacg gggctgctgt ccatcatcct cttctccgcg   1620
tctgggacgt gggccttggg ctccaggatg tgcaggggcc cggcgagcag gacgcgaggg   1680
cagccaggtg ggtcctgggc caggccgggc cgaggctcgc gcgcacgtgc agggggcgcc   1740
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atggtggcgt ccgacaggga cttcttatgg ccgtacctca agccctccgc ctcctccggc   1860
```

154

```
ccttctcgct gtgtcctctc ggtgaaaacg ctggggctgg gagcccaccg agacggctcg    1920
cggcgcccac ctctgccgcc gacgcggata gggtgcgctc cttgagccgc aggccctcca    1980
ggccgtggct gagcccggcc acctcgatgc tgttccgttt gtgcagctgc gcgtggcgcg    2040
cggcggtgag gggctcgctg acctcctgca gcgagtgcgc cacgggcagg ctgtcctcct    2100
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tgtaaaggtg gcgggacagg tctggcgtgc tgttggcggg cctggggggc gggtagggtg    2220
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gctgcgcatt ggtcagctcc ggcacgctga ccgcgcccac cacgggccgc cgctcggcag    2340
ggtaggggta gggagacggg ctgtggaagc tgtagctcag gctgaacggg cagtgtgcgg    2400
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cgggcctgct gtaggcgtac gagctgccga tgttgaggtt tcgcagcgag tggctctgcc    2520
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ggcggtagga cggggggtatc acggcgctgt gccgatggga cgggaggtag tcaggcctca    2640
tgacgtcact cccggtgatg ctagggttgg acgacatcgg cgagggctgc aagtagggct    2700
gaggattatt taaggagttg gtgctgtgtg cactgtagac actggcattt acggatccga    2760
ccgttgaagt caatctgggc tctattcaag cttgtctgaa attgaccata gtatcccttc    2820
ctggttgggc acaaagaggt tatcttggga agaagcatat ggttctgtat aatgtccatt    2880
atagtgcaac tggcggtggg ggaggcatca cgtagggctg gggtttaggc agagacatcc    2940
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ccatgtcttc agtttgaaat tgaatggtct cctctttatt tgccagctct aatgcaaaaa    3120
aggacttgtt gtgggacatg ttggcaatgt catgccacct aaataccaca ggatgccttc    3180
cattcttgtg tttcacaaag ataccttcaa gacacgctcc aatggatatg tcacttcctt    3240
ggctatcctt agcagggtag ctctcttctc catagccatc cattctctct acctcctgca    3300
tgtacagcat ttcagcatca ggagctgtga gccctctgta tttctgatgt agtaaggcca    3360
cttttgggt tgcttcttcc aatacttttt catcttgtaa ccatcccaca ggaaacaagg    3420
caaatttctg aagaaagtcc tgggattcat actgatcaaa gtcaccaaaa atcgcttgaa    3480
cagctaagcc tgctaggtga attggctgtt ccaaggtaca agggatacct tcttcccaga    3540
tatccttcct cagttgcaga taatactggt acccggtaat cctctgctgg aagcgaggaa    3600
cctgaggcgc ttaaaccccc attccaaaat agacggtagg ttccaaggcg tttttttc     3658
```

<210> 344
<211> 419
<212> DNA
<213> Homo sapiens

<400> 344
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ttaaagatgc tgaagctgtc cagaaattct tcctggaaga gatatagctt tggtgaagag     120
atcctagcta aaggtgtaga ccacctgaca aatccaagtg ctgtgtgtgg acagccacag     180
tggttactgc aagtgttaca acaaactctt ccactaccag tgatccagat gcttctgaca     240
aagcccctac cagttaatca gagacttgta agtgctggcg cttggccaaa gacgatgtgg     300
aatgagaaac aaatgtcaac ataataaaat ctcagttaaa atacttgaaa aattcttaac     360
ttggtagttg agcagaaggg caaatatgct tgttatgaac tattctacat tgaaatcta     419
```

<210> 345
<211> 1253
<212> DNA
<213> Homo sapiens

```
        <400> 345
ggaattcctc tgtcccgcca tacacagggt gggacggggc agggcgggca ttgagctttg    60
tgtcctgggg tcaggtgct  tcccctgccg gcctcacccc accaagcgga tctcatggtg   120
ctcctctggc tgggcccacc cgcagtggta tccttctggg ggcccttatg ggagcctgcc   180
gggggtgcag atcctgccgg gggtgcagag cctgctgggg gtgcagatga tttctgggtc   240
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cctttccctc ccacaccacc ccaggaccaa tgggctggct ggaggccacc catgctaaaa   360
taggctcaag ggcctacttt agcttctggg caaaggtctt ggcctgggcc tgactctgtg   420
gccttcctga gctgcctccc cagtaggcct cagtgctggg ctacaggcct cctccattcc   480
ctccattcat gtgaccccac ccctcccagc agaaactctc ttccgtagcc caggagcagc   540
tgttgagggt ttcacctgcc catgccccag cctaaggccg gcttccccag agcagacggg   600
ttgcactctc ctgcccctca ggcccactct gtcatccaac aagctcactg caactggccc   660
atcttaaaaa caacaccggc tggtcacgct ggctcacacc tgtaatccca gcgctgtggg   720
aggccggggc gggggggatca cttaaagtca ggagtttaag accagcctgg gcaacatggt   780
gaaacccgag ctccactaaa aacacaaaaa caaattaagg caccctgagt ggtggtgggt   840
gcctgtggtc ccagcgactc gggaggctga ggcagaattg cttgagccca ggaggtggag   900
gctgcagtga gccacgatcg catcacgcac tccagcccgg gcaacctggc aagaccctga   960
ctctaaaaag aaaaaaacaa caaaaaaaaa aagcccacgt tcaagggcag cactattcaa  1020
aagagggaag caactcagga atccaaacgc gcaggaggga acacatcggg gttcatccac  1080
aggggaacac gattcacccca aaaaaaggaa ggaaaccggc ccggccccgg gacttgaatg  1140
cacctggagg agactgtgat gaacaaaagc acccaaaccc aaaagggcag ggacggggtg  1200
atctgactga ggtgaggacc ccagccagcc aaattcatgg agacagaaag aag          1253




        <210> 346
        <211> 807
        <212> DNA
        <213> Homo sapiens




        <400> 346
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acaattatga aagactcggc ttctgctgct agcgccggag ctgagttagt tctgagaagg   120
tttccctggg cgttccttgt ccggcggcct ctgctgccgc ctccggagac gcttcccgat   180
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cgtgaggaga atgtcccaga aatcctggat agaaagcact ttgaccaaga gggaatgtgt   300
atatattata ccaagttcca aggaccctca cagatgcctt ccaggatgtc aaatttgtca   360
gcaactcgtc agacggggtt tcactgtgtt agccaggatg tctcgatct  cctgacctcg   420
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gccaatattt tgtaattttt agtagagatg gggtttcact atgttggcca ggctagtctt   540
aaactcctgt cctcgtgatc ctcccacctc ggcctccaa  agtgctgaga ttacaggtgt   600
gagccactgc atccagccaa taatatgctc tttaacaaac aatggatcaa aggagaaatc   660
acaagggaaa tagaaaaata cttaaaaatg aatgaacatg aaagaaaaca taccaaacgt   720
atgggaaaca gtgaaaacag tgcaaacgag gcaatttata gctatacacc attaaattta   780
aagataagaa agacgtcaaa ccaacaa                                       807




        <210> 347
        <211> 918
        <212> DNA
        <213> Homo sapiens
```

156

```
        <400> 347
tttttttttt ttagaatata tttcatttta ttataaagca gtgctcccaa acttttcaca      60
gcgtacacct cgagggtgga gaactaacat ccaagcacac ctggatggtg gatgggaccc     120
acttctgggt aacctgatga ggaagctcta gtgaagaaat tcaggacgcg gtcttcagag     180
cagagggctt ggttcaagtc cctgttctgc cacttactaa ctgcatgacc ttgagcaagc     240
cacttaattt ctctgctcct tctctgtgaa atgggtacaa tgtggtcagc agtaaaggaa     300
ctaatacatg tacagcactc agcacaaagc ctggcacaca gcaggctctc accaggtgcc     360
attctcagca caactgcttg gttgagctac tgtggcagtg gcaggttgtg ccccaagggg     420
gtgggctcag gagcccgtgc agcaagaggc agtgaccaag gaggcagggg acaatagccc     480
tatcttttca ggatctctgc cttggacctg gagaatggag agactttgct cctatcacgt     540
cccaagttgg gaaaactaag gacgaagccg gtgactgaca tctgaaatgg aatcctctgc     600
atctccaagt ggccctatac ctgacaatat cattactagt gaaaaccaag tgacaaacac     660
actcctcgac cccaagttct tccacatgtc ccattgagga gagcacagcc aataacgcag     720
agtgtattta tgcgcagggc tggctaaaca ggctggctac gagtccggaa cagtgtcagg     780
atctggcttc ccattggccg acatgacaga atccttctcg cgttgctctc tgatgtactg     840
gtccaacagg gtggtcagct ggaggggctg gtgctggagc agggagtggg tctgggctgt     900
gaggcaggtg gagttctg                                                  918
```

```
        <210> 348
        <211> 1893
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 348
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cttcttcagc accacctttt tggggaagat ttacctagct gccaggaaga agaagaattt     120
tcagttcttg ccagctgcct gggacttctg ccaacgtttt accaaacaga acatccattc     180
atcagtgcct cctgtctgga ttggccagtt ccagcatttg atattataac tcattggtgt     240
tttgagataa aatcatttac tgaaagacat gcagaacaag gaaaggcctt gcttatccaa     300
gagtcaaaat ggaaattacc acacctacta cagttgcctg agaattataa caccattttt     360
cagtactacc acagaaaaac ctgtagtgtc tgcaccaagg ttcctaaaga tcctgctgtt     420
tgccttgtgt gtggtacttt tgtatgcctg aaaggacttt gctgcaagca acaaagttac     480
tgtgaatgtg tactgcactc tcagaactgt ggtgcaggaa caggtatttt ccttttgatc     540
aatgcatcgg taattatcat cattcgaggt caccgcttct gcctctgggg ttccgtgtat     600
ttggatgctc atggagagga agaccgggat cttaggcgag gcaaacctct ctacatttgt     660
aaggaaagat acaaagttct tgagcaacag tggatttctc atacttttga tcacatcaat     720
aaaagatggg gtccacatta caatgggctg tgactctcca cctcagcatt gcatcgtatc     780
atcattttcg ctacgaattt attttttcaac aataagcttt aacttaattt ggggattaa     840
cactttttgct gaggagagaaa aagaaaacat acattatgaa gcctttccaa aattaggtgc     900
ttggtaatca cgttaatggt ataatttttt ttttttaata tctggagaac attaataaca     960
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gcatctgcca agcataatgc atcttttttc ctctgccatt cttgtgttga ttggagaatt    1200
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atgaattact agaggtaata acaaatctta ctataaaatc aagaggttta agaacataca    1560
ctgggcagat gttgattccg tgcatgccca ccttttatta ccaaacaagg ttttgtttat    1620
atgattgtat tagaaatgct cagacttccc cagaaatgaa ccataaattt tggaacttcc    1680
tttcagctca agaggttcag ctatattgta tttgtgcagt ggtaatcact acctatttct    1740
```

157

```
ggctcgggtt tccctaaaag gaaaaaaaag gcggcagtgg gtgatgaccc tcatggaatg    1800
agccacgctt cctgcattcc tccttaggaa ctggctgtgg aaaaccaatt tatggtttgc    1860
aggggtttaa aaatccagta aaaatggggg atg                                 1893
```

```
<210> 349
<211> 1433
<212> DNA
<213> Homo sapiens
```

```
<400> 349
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ggggctggca gtccctgagc tttgatggcg gggccttcca ccttaagggc acaggagagc    180
tgacacgggc cttgctggtt ctccggctgt gtgcctggcc cccactcgtc actcacgggc    240
tgttgctcca ggcctggtct cggcgactcc tgggctcccg gctctcaggc gcatttctcc    300
gagcatccgt ctatgggcag tttgtggctg gtgagacagc agaggaggtg aagggctgcg    360
tgcagcagct gcggaccctc agcctccgac cactgctggc agtgcccact gaggaggagc    420
cggactctgc tgccaagagt ggtgaggcgt ggtatgaggg gaacctcggt gctatgctgc    480
ggtgtgtgga cctgtcacgg ggcctcctgg agcccccag cctggctgag gccagcctca     540
tgcagctgaa ggtgacggcg ctgaccagta ctcggctctg taaggagcta gcctcgtggg    600
tcagaaggcc aggagcctcc ttggagctga gccccgagag gctggctgaa gctatggact    660
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ctatgtagtg tataagtcca ttccctatgg ctccttggag gaggtaatcc cctacctgat    1260
ccggagggcc caggagaacc ggagcgtgct tcagggtgcc cgcagggaac aggagctgct    1320
cagccaaaaa ctgtggcggc ggctgctgcc aggatgccga aggatacccc actagcaccc    1380
ctgaggggggt catgtggtca ataaaagtcc ttaggtgctg cctaaaaaaa aaa            1433
```

```
<210> 350
<211> 1062
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> (1)...(1062)
<223> n = a,t,c or g
```

```
<400> 350
tttttttttt ttccagtcat taatgatctg tccttttgag atctttact tcagaggaag      60
atttaggcaa gagagcaaca tataatagtc agtgatacaa agaagggcat ggaacatttg     120
```

```
gggaacacag gggtttggag ggcctgaagc acaggggtgg tggtattaga aatgtgggaa    180
atatgggcca tgagcctccg gacagaatgg ggtccaggaa ggacagcatc acacactggt    240
gctggaattt ggggatcctt ctgtgggcaa cctcagcagt ctggttattg gcccttttt     300
cttacagcct ggaaaactgg accaagtttc tattgatctc agcgaccgac cggcagcctg    360
taaggggcca tggaagtgtg gaactcattt gttaaaatgt tcaaaacttc cttaacacca    420
tgttcaccct tgcaggcaag gccccatagg attggtctcc caagaaaaat gcacttagct    480
ccaagggcca gagccttctg cacatcattg ccagttctga ccccggcatc caggtagtac    540
ttcatgttcc cctattcagc agctcctact tctgtcaaag catcaattga agcaagaacc    600
tcatcaagct gcctcccacc atggttggaa acaatgatac cctggacatt gtgcttcaca    660
gctaactctg catcctcttt tgtcaaaatc cctttcagga tgatgggcaa tcgagttatg    720
ctctgaaacc aggagagatc attccagcag agagaagtgc tgataggagt catctggaaa    780
taaggtattg catttccctt tttaggtgat tgaagatctg ttagtgttaa gttcctcctc    840
aactggtttc gaatgtcatg tcgcctgttg ccacatacag gtgtatccaa agttattacc    900
aaagctttga aacctaggga ttctaccctc tggatcaact gtttgttcag ctgcaggtct    960
ggatgcacat agagttggaa ccatcggagg ccttcgggag ctcttgctgt gctcatttcc   1020
ccgaattcca ccacnctgga ctagtgttct caaaannntc ga                     1062
```

```
        <210> 351
        <211> 1227
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 351
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        aaccaacgat gagcccatct gagcacatca gacggcagca catgggagtc ccagcgggcc    120
        actctgcggc ccgaacttca cgcaaagctc tggcaccagg actgatggcc agaggctggg    180
        gccttggtgg gggcggggggg cgggcggtgc aggggggctgt gtgtgttgtt ggggagaggt    240
        gcatggggg agagaggtgc ttggggtggg gtagaggtgc gtgggagatg ctcggtccga    300
        gtgcacacac atgcatggga acatgtgcag gagtatgtgc gtgtgtgtat gcgtgacagc    360
        atgtgtgagc gtgagtgtgc atgtgtgaac gtgtgcgtga gcatgtgcaa gtgggcgtgc    420
        atttgtgtgt gtgtacgtgt gagcgcatct gcgtgcctgt gcacgagcgg gaggggtggc    480
        tggcctgggt gtgcagggag ctgggtgtga ggaccgtgct gtccactgct gggtctcgcc    540
        caggaggcag agctcatgct cggagccacc gtgagcctca gggagggtac tgagctgccc    600
        cacagccgac ctgtccccag gcccccactg cagggcagcc ctccagagcc aggtgagcag    660
        cagacacctt gcctggccca aggctccgca ggggtggatc catgccctgg gtcaccacgg    720
        cccaggcact ccctttgcca tctgcggccc caggaggttt acctataaaa aaaacaaaca    780
        aacaaacaaa caaaacagga cgaggtcgcc cagaggccaa gcctccccgg ccgggacccc    840
        attccccagg tgtgctgctg gcttcctcct ccctgggccc agcctgccac agaaagcctg    900
        agacagaaca aaccaaatca gagagaactg caagggggcc gggcgcggag gctcacgcct    960
        gtaatctcag cactctggga ggccgaggca ggtggatgac cttaggagtt tgagaccagc   1020
        ccggccaaca tggtgaaatc ccttctctac taaaaataca aaaaattag ccgagcatgc   1080
        tggtaggcac ctgtaatccc cagctactca ggagcctaag gcaggacgat cacttgaacc   1140
        cgggaggcgg aggttgcagt gacccgagat tgagccactg cactccagcc tgggcagcaa   1200
        gagtgaaact ccatctcaaa aaaaaaa                                       1227
```

```
        <210> 352
        <211> 1194
        <212> DNA
        <213> Homo sapiens
```

<400> 352
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ggtttcaata ggtttcaagc agaagggaca ctgcctacca cttgcggtcc catttctgat   120
gaagggtgat tatcatgtgg caaactcaca tttgcatgac tggcaaagta aaaagataga   180
taactttttg tcaacatatc tttaagagtt tatatcacgc acagtttaaa atcatgacga   240
gatgctgatg gttggactat attcatgtct cgtatgttgc accatatttt ggttcacagt   300
ttatccatga tttagcatgc caagagaaca tctcagtcag taagagaaca tctcagtcag   360
tgtcaccttg agaagagcat caaaagcaga·gggagcagaa ggaggaccgt ctgggcttgg   420
agactcggcg caccccaca ctccctcgca ttctcctcag gatggaagcc atgacaagat   480
tctgggcgcc ttctgatctt ctgggccttt agacgttcac acttaaggga ttcattatgt   540
tgactgtagt taaggcatgt ttccaaggat tgctttttc tactctgcat ttcagaggtc     600
aaaatttggc aatgacaact ctcttaacta ctctctctct ccaacagtgg aaaggatgta     660
attttccttc tctaatattt ctccccagg tttccttacc actgataccc cttactggtt     720
tccgtggtag tgagtggacc tgcacacaaa aggatatacc tgatttcaat gggtgccatg   780
gtgatggggg ccacagattc acagaggcag ctgctgtcca ccaccaccat gaacaggttg   840
ctgcttggga tttgctggat gacaaaggac ctgttggaac aagaggtagc gaggcagtca   900
tttaccatcc gtcaattaaa gagccatgag gaagacttct ctcctgggtg gtagcaacta   960
ccatattttg taaagcaaat tttggagact attttactac taatgttacc ttctttctcc  1020
atgaggctct tcacttacaa atacctagct tcactaggaa aacaacaata gctatgacga  1080
catgcggctc atacaactca ccttggaaag actgaagtgc tgtatgtaca aaacacaaga  1140
gtcagagttg gctgaatcac ctgttcccaa ggtttaagag gtcagacttt caaa         1194
```

<210> 353
<211> 1140
<212> DNA
<213> Homo sapiens

<400> 353
```
actctcacaa ttaaaacatt tggaaaggaa ttaatggtgt atttccatta gggaaagtgc    60
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ctttgggagc agcgagggga atgtgtctct caccctagg cctcctggtc tggctcctgc     180
tcaggccaca cggcgcaccc accccagcg cgcctcagtc caggtcactg ggcagggtgt      240
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gtgtttgaga ccaccggctc ccaagtgcgt cgccttgggg gtttgcatcg gctcctcagc   360
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gagatctccg gtgcaggtcg ggggagggga gcccctcg ggctgtggtt agagcgggag      480
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gcacacctgg gctcaagcgc taatgacgac aggggactga gtgaatggga cccccatgga   660
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ggtcggaggc tgggggagcg agacctccag tgcccgtgcg ctgggggag agggtggagg    780
ggccacttag atgtaggagt catcaccacc gggcgcatcg tagggacccc caccctccc    840
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gccagctcgg gccgctgcgg ggggctcaag ggcaccgcct ggggaggcag ggccggggg   1080
tgcgggctat gcgggcatcg gtgcctccgc gggcttgggg tcgtgcgtgg ggctggggac  1140
```

<210> 354
<211> 2401

160

<212> DNA
<213> Homo sapiens

<400> 354

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ctttaaatat ccttagagca ttgttcagag atacgcgcct gggagaaaat attattcctt       120
atgttgctga tggagctaag gctgcaattc tgggtttttac atcaccggtc tgggcagtgc       180
gaaattcatc cacacttctc tttagtgcct tgatcacaag aatttttgga gttaaaaggg       240
caaaggatga acattccaaa acaaatagaa tgacagggag agagtttttc tctcgtttcc       300
cagaactcta tccttttctt ctcaaacagt tggaaactgt agccaataca gtagacagtg       360
atatgggaga accaaatcgt catccaagca tgtttctctt acttttggtg ttggagagac       420
tctacgcttc cccgatggat ggtacttctt ctgctctcag catgggacct tttgttccct       480
tcattatgag gtgtggtcac tcacctgtct accactcccg tgaaatggca gctcgtgcct       540
tggtcccatt tgttatgata gatcacattc ctaataccat tcgaactctg ttgtccacac       600
tccccagctg cactgaccag tgtttccggc aaaaccacat tcatgggaca cttctccagg       660
tttttcattt ggtgcaagcc tactcagact ccaaacacgg aacgaattca gacttccagc       720
acgagctgac tgacatcact gtttgtacca aagccaaact ctggctggcc aagaggcaaa       780
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gaagcggcat gttgaagaaa atctggggga ttgggatggg ggtatgtgtg gattttttcct      2340
ccactaaatc tgcaggaaac atgttgaaca taaattcaaa aattttatcc caaaaaaaaa      2400
a                                                                     2401
```


<210> 355
<211> 2186
<212> DNA
<213> Homo sapiens

<400> 355

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agtagggcct tcgcgcacct catggaatcc cttctgcagc acctggatcg cttttccgag   180
cttctggcgg tctcaagcac tacctacgtc agcacctggg accccgccac cgtgcgccgg   240
gccttgcagt gggcgcgcta cctgcgccac atccatcggc gctttggtcg gcatggcccc   300
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gcccgccttg cccgccggcg tctgcggtg cacatgctgc gcttcaatgg ctatagagag     600
aacccaaatc tccaggagga ctctctgatg aagacccagg cggagctgct gctggagcgt   660
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gagcgcttgc ctcagaacaa cttcctgaag gtgatagcgg tggcgctgtt gcagccgcct   780
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agtttgcttt ttaatagaag gcccatttgt aagaatgttg aaaatatgtg taccgtttaa  1560
agaaaaagca gctttaaagt gacaaacaaa ataccctttt tcttttagta tgggttatt  1620
ttctaggttt tctgtccctc cctcagtagt gaagagtttt ctttattcct ggcagtgtca  1680
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cggctaattt tttgtatttt tagtaaaaac ggggtttaac catgctggcc aggctggtct  2160
caaacacctg accttgggat ccgtcc                                       2186
```

```
<210> 356
<211> 1142
<212> DNA
<213> Homo sapiens
```

```
<400> 356
attcacatct tattcagcat caaagaattc acacatgaga gtaagcacat gaatgtaatg   60
aatgtggaaa agctttcagt caaacctcat gccttattca gcatcacaaa atgcatagga   120
aagagaaatc gtatgaatgt aatgagtatg agggcagttt cagtcatagc tcagatctta   180
tcctgcaaca agaagtcctc accagacaga aagcctttga ttgtgatgta tgggaaaaga   240
actccagtca gagagcacat ctagttcaac atcagagcat tcataccaaa gagaactcat   300
gaatgtaatg aagatgggaa gatatttatc aaattcaggc ttcattcagc atctgagagt   360
tcacaccagg gagaaatcat gtatgtactg catgtggtaa agccttcagt catagctcag   420
ccattgctca gcatcagata attcacacca gagagaaacc ctctgaatgt gacgaatgaa   480
gaaaaggtat tagtgttaaa ctcttaatcg actctgcaa atctataccaa gtgagaaatc   540
ttacaaatgt attgaatgtg gcaatttt catgctatta gtattttcat accttagtca   600
catttggaga attcacatgg gaataaaatt ccattgctgc aatgaatgtg aaaaagccat   660
cagtcaaaga aactaccttg tttagtatca aattcacgcc atgcaaaaag attataaatg   720
```

162

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taataagcat gtatgtgtgt gaggagattc agtcataacc caacgctcat tcaacatcaa      780
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<210> 357
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<212> DNA
<213> Homo sapiens

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<400> 357
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<210> 358
<211> 4747
<212> DNA
<213> Homo sapiens
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<212> DNA
<213> Homo sapiens

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165

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            <211> 2017
            <212> DNA
            <213> Homo sapiens
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<212> DNA
<213> Homo sapiens

<400> 361
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<212> DNA
<213> Homo sapiens
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171

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        <212> DNA
        <213> Homo sapiens
```

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        <400> 367
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ggtcaaaagc tttcttttcca agatacctag cgtcttctct ggttcagaca ttgttcaatg   180
gttgataaag aacttaacta tagaagatcc agtggaggcg ctccatttgg gaacattaat   240
ggctgcccac ggctacttct ttccaatctc agatcatgtc ctcacactca aggatgatgg   300
caccttttac cggtttcaaa cccctatt ttggccatca aattgttggg agccggaaaa   360
cacagattat gccgtttacc tctgcaagag aacaatgcaa aacaaggcac gactggagct   420
cgcagactat gaggctgaga gcctggccag gctgcagaga gcatttgccc ggaagtggga   480
gttcattttc atgcaagcag aagcacaagc aaaagtggac aagaagagag acaagattga   540
aggaagatc cttgacagcc aagagagagc gttctgggac gtgcacaggc ccgtgcctgg   600
atgtgtaaat acaactgaag tggacattaa gaagtcatcc agaatgagaa acccccacaa   660
aacacggaag tctgtctatg gtttacaaaa tgatattaga agtcacagtc ctacccacac   720
acccacacca gaaactaaac ctccaacaga agatgagtta caacaacaga taaaatattg   780
gcaaatacag ttagatagac atcggttaaa aatgtcaaaa gtcgctgaca gtctactaag   840
ttacacggaa cagtatttag aatacgaccc gtttctttttg ccacctgacc cttctaaccc   900
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gagggtaaaa cgatggggtt ttggcatgga cgaggcattg aaagacccag ttgggagaga  1020
acagttcctt aaatttctag agtcagaatt cagctcggaa aatttaagat tctggctggc  1080
agtggaggac ctgaaaaaga ggcctattaa agaagtaccc tcaagagttc aggaaatatg  1140
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caaaaccaca cagaacgtga aggaacctgg acgatacaca tttgaagatg ctcaggagca  1260
catttacaaa ctgatgaaaa gtgattcata cccacgtttt ataagatcca gtgcctatca  1320
ggagcttcta caggcaaaga aaagagggga aatctctcac gtccaagagg ttaacaagcc  1380
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ctctctctct ctctctcaaa gcttcagtta gacacacagt tcactgaaaa ttcagtcagt  1740
caaaaactgg aagaactgta aaagaaaaaa gtatatatca ataagtatac atgtggcttc  1800
acatttatta aacaataaat tccgcacaga aagtttcatt tcaccaatgt gtcacagtca  1860
gaaacaaact catgtcttcg gtctgttgtc tgtacattct ccgttaatgt ttctcgcatt  1920
tattttttata ccatatttaa agaagaaaca cctttttactc caaatgtatt aaagttgatc  1980
```

```
ccttctctgt aaatttgtgt atgtttatat tgttgtttta tctttcatta aaagatgtca    2040
gaatctcaaa aaaaaa                                                     2056
```

```
<210> 368
<211> 460
<212> DNA
<213> Homo sapiens
```

```
<400> 368
ggcacgaggg actatccacg cattgtgaac cacctggacc acacctatgt cactgcgccc     60
caagccttca tgatgttcca gtactttgtg aaggtggtgc ccactgtgta catgaaggtg    120
gacggagagg tactgacgac aaatcagatc tatgtgacca gacatgagaa ggctgcctat    180
gtgctgatgg gcgaccaagg ccttcccgga gtcttcatcc tctatgagct ctcgcccatg    240
atggtgaacc tgacggagat acacacgttc ttctctctct tcctgacaat tgtgggcgct    300
caccataggt ggcatgttct ttgagcattt tgtcattaat tacttaaccc ataagtgggg    360
gcttgggttc tatttcaaaa atgaaaactc tttacagggt ggccatagga ctttatatgg    420
agtgaacttt tttatgtatt ggagtttacg gggggctct                           460
```

```
<210> 369
<211> 2355
<212> DNA
<213> Homo sapiens
```

```
<400> 369
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ttgcggccgg gcagtctttc tggccttcgg gctagggctg ggcctcatcg aggaaaaaca    120
ggcggagagc cggcgggcgg tctcggcctg tcaggagatc caggcaattt ttacccagaa    180
aagcaagccg gggcctgacc cgttggacac gagacgcttg cagggctttc ggctggagga    240
gtatctgata gggcagtcca ttggtaaggg ctgcagtgct gctgtgtatg aagccaccat    300
gcctacattg ccccagaacc tggaggtgac aaagagcacc gggttgcttc agggagagg     360
cccaggtacc agtgcaccag gagaagggca ggagcgagct ccggggccc ctgccttccc    420
cttggccatc aagatgatgt ggaacatctc ggcaggttcc tccagcgaag ccatcttgaa    480
cacaatgagc caggagctgg tcccagcgag ccgagtggcc ttggctgggg agtatggagc    540
agtcacttac agaaaatcca agagaggtcc caagcaacta gcccctcacc ccaacatcat    600
ccgggttctc cgcgccttca cctcttccgt gccgctgctg ccaggggccc tggtcgacta    660
ccctgatgtg ctgccctcac gcctccaccc tgaaggcctg gccatggcc ggacgctgtt    ·720
cctcgttatg aagaactatc cctgtaccct cgccagtac ctttgtgtga acacacccag    780
cccccgcctc gccgccatga tgctgctgca gctgctggaa ggcgtggacc atctggttca    840
acagggcatc gcgcacagag acctgaaatc cgacaacatc cttgtggagc tggacccaga    900
cggctgcccc tggctggtga tcgcagattt tggctgctgc ctggctgatg agagcatcgg    960
cctgcagttg cccttcagca gctggtacgt ggatcggggc ggaaacggct gtctgatggc   1020
cccagaggtg tccacggccc gtcctggccc cagggcagtg attgactaca gcaaggctga   1080
tgcctgggca gtgggagcca tcgcctatga atcttcggg cttgtcaatc ccttctacgg   1140
ccagggcaag gcccaccttg aaagccgcag ctaccaagag gctcagctac ctgcactgcc   1200
cgagtcagtg cctccagacg tgagacagtt ggtgagggca ctgctccagc gagaggccag   1260
caagagacca tctgcccgag tagccgcaaa tgtgcttcat ctaagcctct ggggtgaaca   1320
tattctagcc ctgaagaatc tgaagttaga caagatggtt ggctggctcc tccaacaatc   1380
ggccgccact ttgttggcca acaggctcac agagaagtgt tgtgtggaaa caaaaatgaa   1440
```

```
gatgctcttt ctggctaacc tggagtgtga aacgctctgc caggcagccc tcctcctctg   1500
ctcatggagg gcagccctgt gatgtccctg catggagctg gtgaattact aaaagaactt   1560
ggcatcctct gtgtcgtgat ggtctgtgaa tggtgagggt gggagtcagg agacaagaca   1620
gcgcagagag ggctggttag ccggaaaagg cctcgggctt ggcaaatgga agaacttgag   1680
tgagagttca gtctgcagtc ctgtgctcac agacatctga aaagtgaatg gccaagctgg   1740
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caaggcactg gctgtcagtg gcagagtttg gctgtgacct ttgcccctaa cacgaggaac   1860
tcgtttgaag ggggcagcgt agcatgtctg atttgccacc tggatgaagg cagacatcaa   1920
catgggtcag cacgttcagt tacgggagtg ggaaattaca tgaggcctgg gcctctgcgt   1980
tcccaagctg tgcgttctgg accagctact gaattattaa tctcacttag cgaaagtgac   2040
ggatgagcag taagtaagta agtgtgggga tttaaacttg agggtttccc tcctgactag   2100
cctctcttac aggaattgtg aaatattaaa tgcaaattta caactgcaga tgacgtatgt   2160
gccttgaact gaatatttgg ctttaagaat gattcttata ctctgaaggt gagaatattt   2220
tgtgggcagg tatcaacatt ggggaagaga tttcatgtct aactaactaa ctttatacat   2280
gatttttagg aagctattgc ctaaatcagc gtcaacatgc agtaaaggtt gtcttcaact   2340
gaaaaaaaaa aaaaa                                                     2355
```

```
<210> 370
<211> 1333
<212> DNA
<213> Homo sapiens
```

```
<400> 370
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cttgtccact gcctgtcttc ggttccaact gctggttctc ctagaggcct ctcctcagac    120
tcgcagagct gcctgatcat tgctacagaa tgaactctag cccagctggg accccaagtc    180
cacagccctc cagggccaat gggaacatca acctggggcc ttcagccaac ccaaatgccc    240
agcccacgga cttcgacttc ctcaaagtca tcggcaaagg gaactacggg aaggtcctac    300
tggccaagcg caagtctgat ggggcgttct atgcagtgaa ggtactacag aaaaagtcca    360
tcttaaagaa gaaagagcag agccacatca tggcagagcg cagtgtgctt ctgaagaacg    420
tgcggcaccc cttcctcgtg ggcctgcgct actccttcca gacacctgag aagctctact    480
tcgtgctcga ctatgtcaac gggggagagc tcttcttcca cctgcagcgg gagcgccggt    540
tcctggagcc ccgggccagg ttctacgctg ctgaggtggc cagcgccatt ggctacctgc    600
actccctcaa catcatttac agggatctga aaccagagaa cattctcttg gactgccagg    660
gacacgtggt gctgacggat tttggcctct gcaaggaagg tgtagagcct gaagacacca    720
catccacatt ctgtggtacc cctgagtact tggcacctga agtgcttctg aaagagcct    780
tatgatcgag cagtggactg gtggtgcttg ggggcagtcc tctacgagat gctccatggc    840
ctgccgccct tctacagcca agatgtatcc cagatgtatg agaacattct gcaccagccg    900
ctacagatcc ccggaggccg gacagtggcc gcctgtgacc tcctgcaaag ccttctccac    960
aaggaccaga ggcagcggct gggctccaaa gcagactttc ttgagattaa gaaccatgta   1020
ttcttcagcc ccataaactg ggatgacctg taccacaaga ggctaactcc acccttcaac   1080
ccaaatgtga caggacctgc tgacttgaag cattttgacc cagagttcac ccaggaagct   1140
gtgtccaagt ccattggctg tacccctgac actgtggcca gcagctctgg ggcctcaagt   1200
gcattcctgg gatttctta tgcgccagag gatgatgaca tcttggattg ctagaagaga   1260
aggacctgtg aaactactga ggccagctgg tattagtaag gaattacctt cagctgctag   1320
gaagagctgt att                                                       1333
```

```
<210> 371
<211> 2457
<212> DNA
<213> Homo sapiens
```

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      <400> 371
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ctcctcccca gggcccggcg cccatccct tccagcaccg cggcggggat tccccggagg      120
ccaagaatcg cgtgggcccg caggtgccac tcagcgagcc aggtttccgc cgtcgggagt      180
cgcaggagga gccgcgggcc gtgctggctc agaagataga gaaggagacg caaatcctca      240
actgcgccct ggacgacatc gagtggtttg tggcccggct gcagaaggca gccgaggctt      300
tcaagcagct gaaccagcgg aaaaagggga agaagaaggg caagaaggcg ccagcagagg      360
gcgtcctcac actgcgggca cggccccccc tctgagggcg agttcatcga ctgcttccag      420
aaaatcaagc tggcgattaa cttgctggca aagctgcaga agcacatcca gaaccccagc      480
gccgcggagc tcgtgcactt cctcttcggg cctctggacc tgatcgtcaa cacctgcagt      540
ggcccagaca tcgcacgctc cgtctcctgc ccactgctct cccgagatgc cgtggacttc      600
ctgcgcggcc acctggtccc taaggagatg tcgctgtggg agtcactggg agagagctgg      660
atgcggcccc gttccgagtg gccgcgggag ccacaggtgc ccctctacgt gcccaagttc      720
cacagcggct gggagcctcc tgtggatgtg ctgcaggagg ccccctggga ggtggagggg      780
ctggcgtctg cccccatcga ggaggtgagt ccagtgagcc gacagtccat aagaaactcc      840
cagaagcaca gccccacttc agagcccacc ccccggggg atgccctacc accagtcagc      900
tccccacata ctcacagggg ctaccagcca acaccagcca tggccaagta cgtcaagatc      960
ctgtatgact tcacagcccg aaatgccaac gagctatcgg tgctcaagga tgaggtccta      1020
gaggtgctgg aggacggccg gcagtggtgg aagctgcgca gccgcagcgg ccaggcgggg      1080
tacgtgccct gcaacatcct aggcgaggcg cgaccggagg acgccggcgc cccgttcgag      1140
caggccggtc agaagtactg gggccccgcc agcccgaccc acaagctacc cccaagcttc      1200
ccggggaaca aagacgagct catgcagcac atggacgagg tcaacgacga gctcatccgg      1260
aaaatcagca acatcagggc gcagccacag aggcacttcc gcgtggagcg cagccagccc      1320
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tccctcaaca aggaggagct gaagaaagtg tgcggcgagg agggcgtccg cgtgtacagc      1500
cagctcacca tgcagaaggc cttcctggag aagcagcaaa gtgggtcgga gctggaagaa      1560
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cccctgtctg gaggcacaac gcccatcctt aggccaaaca gtacccaagg cctcagccca      1800
caccaagact aatctcagcc aaacctgctg cttggtggtg ccagccccctt gtccaccttc      1860
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tgggggggtcc tggcccctgt gatgctcccc catccccacc cacttctaca tccatccaca      1980
ccccagggtg agctggagct ccaggctggc caggctgaac ctcgcacaca cgcagagttc      2040
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aaagtggggg aacgacacac acttcacctg caaggggcccga caacgcaggg gacaccgtgc      2160
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agttaagtct caaaaaaaaa aaaaggggg ggccgtttta aagaacccctt ggggggggccc      2400
aagttaacgc gggctggcaa ggtaaaagtt ttttccttat agggagccgt ataaaac        2457
```

```
      <210> 372
      <211> 1333
      <212> DNA
      <213> Homo sapiens
```

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      <400> 372
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acggagacag cctcgttgtg ctggtggcca cagtggtggc tcttctggac atctgcttca      120
tcttagtggc tgttccagaa tctctgcctg agaaaatgag accggtttcc tggggagctc      180
```

```
agatttcttg gaaacaagca gacccttttg cgtcgttgaa gaaagttgga aaagattcta    240
ctgtcttact aaatctgcat caccgtgtgt ctttcatacc ttcctgaagc tgggacagta    300
ttcaagtttt ttttctctat ctcagggcag gtcatagggt ttgggatctg ttaaaattgc    360
agcattcata gctatggtag gaattctgtc tattgtggct cagacggcct ttcttagcat    420
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cctggggcca gcactgtatg gcttcatatt ctacatgttc catgtggaac tgactgagtt    720
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ggagctctct tcatttgagg agcctgggaa tcagtgcact gagctgtaaa ctcggcagaa    1020
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tcatggtgct ggatgggaga cgctagcggc atccttcagg gccaagtttg ataaatacca    1140
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tcccggttaa tccttaaaac cagaaaaaaa ttggaaaaac ttctttgcaa aaaggggggca    1260
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tgaaaggaca aaa                                                        1333
```

<210> 373
<211> 2578
<212> DNA
<213> Homo sapiens

<400> 373
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gttctggtgg tgaacgtgag cggacggcgc tttgagactt ggaagaatac gctggaccgc    180
tacccagaca ccttgctggg cagctcggag aaggaattct tctacgatgc tgactcaggc    240
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ggcgaggaac aggctgtttg tgtcaggaac cgttctgcct ttgaacagca acatcaccac    1440
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gaagccctgg gagccgtctc gccgggtggc cgcaccagcc gtagcacctc tgtgtcttcc    1560
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catgctggca gggcttgcgc aggagccatg ccccttcaga gccgctccag ccttcaatgc    1740
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caagccccat gacagccttg acctgaactg cgacagcggg ggacttcgtg gctgccatta   1800
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ccgagactgt caagatctca tccctgtgag gggtaggcct gctgattcag agggtcctct   1980
tcatttttgg gaactccttt ccaaagccat atttttggga ggcagagagg ggcaggcttg   2040
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caaagctttg atcccgacatc tgagctctag cctaagaagg agagttgaga tttcctcctc   2340
cctctggctg ggatatggag ctttggaggt tcagagaaga gaaccctcac ctctgatctg   2400
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gaatgcaaac acaggcttca tggggctgtg gccttctggc aggcgacctg ccatccccag   2520
ggccttgcct gaggggttc aggcttgcct tttcccaaca cacactcaga taggcaca       2578
```

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        <210>  374
        <211>  664
        <212>  DNA
        <213>  Homo sapiens
```

```
        <400>  374
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cccgccctgt tagttggggc tggggagggc cgcgcaccga gactaaattg tccttccggg   120
cagatccgct caccaggccc tggcgacctg agcatctacg acaactggat ccggtacttc   180
aaccgcagca gcccggtgta cggcctggtc cccagagcaa gacttcagcc aggatctacc   240
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ctca                                                                 664
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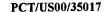
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        <213>  Homo sapiens
```

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acctgcttcc tcctgggcgt gggctgccgg ctgaccccgg gtttgtacca cctgggccgc   180
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aacaaacagc tggggcccaa gatcgtcatc gtgagcaaga tgatgaagga cgtgttcttc   300
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aggccacggg acagtgactt cccaagtatc ctgcgccgcg tcttctaccg tccctacctg   420
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```

```
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gccgttatcc atctggaggc tgcaggtcc ttggggtaac agggaccaca gacccctcac   1440
cactcacaga ttcctcacac tggggaaata aagccatttc agaggaaaaa aaaaa         1495
```

```
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        <211> 373
        <212> DNA
        <213> Homo sapiens
```

```
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tgacagcaaa taacactttg agcaagccca ccagatacca ggcgagctga aggaaatcaa    180
gcaagatatc tccagcctgc gctatgagct tcttgaggaa aaatctcaag ctactggtga    240
gctggcagac ctgattcaac aactcagcga gaagtttgga aagaacttaa acaaagacca    300
cctgagggtg aacaagggca aagacattta gcagcccaca tcggcgtctg tgacttctac    360
cagcattcca agg                                                       373
```

```
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        <211> 2867
        <212> DNA
        <213> Homo sapiens
```

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gcctgtaatt cagtgtttac agcattagat cactgtcatg aagccataga aataacaagc    180
gatgaccacg tgattcagta tgtcaaccca gccttcgaaa ggatgatggg ctaccacaaa    240
ggtgagctcc tgggaaaaga actcgctgat ctgcccaaaa gcgataagaa ccgggcagac    300
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caaggaggga aaattaggca ttttgtctcg ctcaagaaac tgtgttgtac cactgacaat    480
aataagcaga ttcacaagat tcatcgtgat tcaggagata attctcagac agagcctcat    540
tcattcagat ataagaacag gaggaaagag tccattgacg tgaaatcgat atcatctcga    600
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178

```
ggcagtgatg caccaagcct gcagaatcgt cgctatccgt ccatggcgag gatccactcc    660
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```

```
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        <212> DNA
        <213> Homo sapiens
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        gatgttaatc tgcaagtccc tgacagagca gttttaggga ccattcatcc agatccagaa   180
        attgaagaaa gcaagcaaga aactagtatg attttggata gtgaaaaaac aagtgagact   240
        gctgccaaag gggtcaacac aggaggcagg gaaccaaata caatggtgga aaaagaacgc   300
        cctctggcag ataagaaagc acagagacca tttgaacgaa gtgactttttc tgacagcata   360
        aaaattcaga ctccagaatt aggtgaagtg tttcagaata agattctga ttatctgaag   420
        aacgacaacc ctgaggaaca tctgaagacc tcaggcttg caggggagcc tgagggagaa   480
        ctctcaaaag aggaccatga gaacacagag aagtacatgg cacagaaag ccagggtct   540
        gctgctgcag aacctgaaga tgactcgttc cactggactc cacatacaag tgtagagcca   600
        ggcatagtg acaagaggga ggacttactt atcataagca gcttctttaa agaacaacag   660
```

179

```
tctttgcagc ggttccagaa gtactttaat gtccatgagc tggaagcctt gctacaagaa   720
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<212> DNA
<213> Homo sapiens
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<212> DNA
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<212> DNA
<213> Homo sapiens

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        <213> Homo sapiens

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        <221> misc_feature
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        <223> n = a,t,c or g
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<211> 2204
<212> DNA
<213> Homo sapiens
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<210> 387
<211> 798
<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens .

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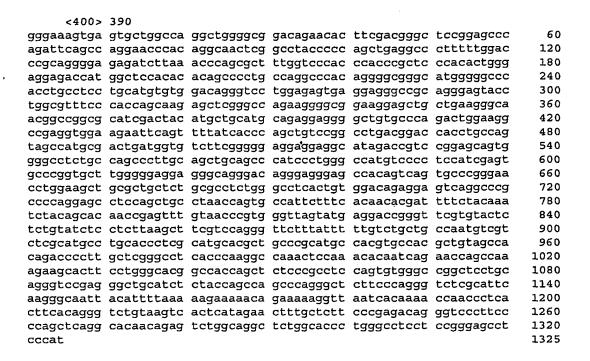



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     tctgaaaaca  tccacggtga  agggcagggc  caggcctggc  tgtggagtgg  gccagctgag     180
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     acattcctga  gcgctgacaa  cgtggagccc  tcaccgcccc  cacctacccc  aacctcaatg     300
     gggaaggaaa  ggggcctgag  ctgggcaggg  ctgcccgggc  tcactatgtg  cctgctccag     360
     gagtccctgg  cccctgtgct  ggcaggagca  tccctgagct  ggaccgggag  gcctctctgg     420
     cctggggctg  ctccctgccc  ggcaggctgc  tgtttggcag  ctggaggtgg  caagagctgc     480
     tggtgctgcc  agggcgtgtt  ggccaggaat  gagctcccag  ggcagccctg  aggaaagggt     540
     cttaggaagc  gcctcccagc  tcactactag  gagctgggga  ctgtcagtgc  tgagtggggc     600
     tggggtacag  gagcacctgc  ctctcctttc  tttggcttag  aagtgggggaa ggaagggcca     660
     ggaaaaggga  ccaaagccgc  cccagccttg  gcccctaggc  cgcctgggga  ctgtgtgtgt     720
     gctgaggggg  cagtgggagg  tgggcagctc  tggagttccc  tgcaccctgg  gatccttggg     780
     ctgctctcac  tcccggggtc  ccagcagggc  aaggcctctg  cttgggacca  gtgctgctct     840
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     cgacaggccg  tcgcagtccc  ccggctccgg  agggccggct  gggaaccccc  agcccttccc    2160
     aagagctcca  gggcaagggc  agtgaggaag  aggagccttg  gcccgccat   gccacagcca    2220
     gggcagggac  atccaggcat  gccacgtacg  tgcggcggcg  gcggcggcga  tccgggcggc    2280
     cccagcccgg  gaattcggtn  ncggtcgtcg  tgcgtacggc  ttcaatnatc  aaanngnggc    2340
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     <210> 390
     <211> 1325
     <212> DNA
     <213> Homo sapiens
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<400> 390
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ccgcagggga gagatcttaa acccagcgct ttggtcccac ccaccgctc ccacactggg    180
aggagaccat ggctccacac acagcccctg ccaggcccac aggggcgggc atggggccc    240
acctgcctcc tgcatgtgtg gacagggtcc tggagagtga ggagggccgc agggagtacc    300
tggcgtttcc caccagcaag agctcgggcc agaaggggcg gaaggagctg ctgaagggca    360
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ccgaggtgga agaattcagt tttatcaccc agctgtccgg cctgacggac cacctgccag    480
tagccatgcg actgatggtg tcttcggggg aggaggaggc atagaccgtc cggagcagtg    540
gggcctctgc cagcccttgc agctgcagcc catccctggg ccatgtcccc tccatcgagt    600
gcccggtgct tggggggagga gggcagggac agggagggag ccacagtcag tgcccgggaa    660
cctggaagct gcgctgctct gcgcctctgg gcctcactgt ggacagagga gtcaggcccg    720
ccccaggagc ctccagctgc ctaaccagtg ccattctttc acaacacgat tttctacaaa    780
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tctgtatctc ctcttaagct tcgtccaggg ttctttattt ttgtctgctg ccaatgtcgt    900
ctcgcatgcc tgcaccctcg catgcacgct gcccgcatgc cacgtgccac gctgtagcca    960
cagacccctt gctcgggcct cacccaaggc caaactccaa acacaatcag aaccagccaa   1020
agaagcactt cctgggcacg gccaccagct ctcccgcctc cagtgtgggc cggctcctgc   1080
agggtccgag ggctgcatct ctaccagcca gcccagggct cttcccaggg tctcgcattc   1140
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cttcacaggg tctgtaagtc actcatagaa ctttgctctt cccgagacag ggtcccttcc   1260
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cccat                                                              1325
```

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<210> 391
<211> 1458
<212> DNA
<213> Homo sapiens
```

```
<400> 391
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cctgcggagt ttgtcctcac gcacaccaca cacgatcggg tataaaacac attctataaa    180
cacgttctga tgcaaactgt gtgtccataa atatatattt atgcaagttc ctcccaccca    240
ctgcagggcc gtacagctct ggggacagga ggtcacagcc gactttaaac cacaggttaa    300
gtagaaggtt gcaggtcaaa tagaagttcc cgtgtgattg catcacccaa cggcactgtt    360
ctgtcatcag gaaatgctga gtgcccgccg tggccgggtg ggcgcgggcg gtggtcagac    420
gctgctctgg agctggctat ctgtggcact gtcaggggct gaggactggc tgggcagaca    480
agtttccagg ccatctgaag actccgacag gggcttgtat aagaagcagg ctatggcaaa    540
gaagaggacg cccagcacct tgtacaggag ccccatgatg agtatgtagc ggctcatggc    600
cgaattctgg tacaccaagc aggagccctg ctggccacac tggtcctgcc acagcagaca    660
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tgccgttagt gcaggaatgc tgctgaggaa tgtaaagaaa attacaacga atatgaaaac    840
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gggcggtagg cagcggctcc actcaccttc tggccgtcca cattcgtctc cgtggctgca   1080
gggcaccctg cgtggcacag tgagaagtac atgaggccgt ccgagccgca cacagggctg   1140
tagtgttctg ctggcagct gcaggcagcg ttgcaggag ccgttaggtt caggtggcct   1200
tcgggcagga ggctcccgcc gtagctggct gtgacgcccg ccatgggcac actggggcag   1260
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```
tgcagtgaga agacgaggat gcccagcagg ctgacaacgg tgcagaacag gcagaacttg   1320
atgaccgcgg agccccggag cctgagcttg ttcacaaaga agccgcccag gaaggtgccg   1380
ccaccacccg ctggcaccac caggtaccca aacaaggtgg cagcttctga ggcactcagg   1440
cgaattccac cacacgga                                                 1458
```

```
<210> 392
<211> 1667
<212> DNA
<213> Homo sapiens
```

```
<400> 392
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cattcacaca aacacaggta ctgaataaat taaacgctca ggctctggcc ccaccccagc    180
tttcagagcc cacaagcaga ctgtacaaag tcaataattt aaaacccaaa ccctgggcac    240
agtgcctgga agtgtcaggg tcacccactc cccttaagtt agccactata catgttcatc    300
ttctgacagg cggggccagg acagacgcca ggcacaggaa tcagggcctg gggtccctgg    360
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gctcagagga aataacctca acaaataaat taaacaataa atagccccgg tgggccgagg    480
gcacctccag ggggtcacac cataaataac agagttggcg gcgggtacgg ctcgcgtggg    540
cgggcgggcg cggaggccag gacttgcatt gtgtgtgcag gacgtgccca gacgcacacc    600
gcaggactga gggcgggagg tgggcttggg accctgcgcc ggcggaaaga gctccgggtg    660
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agtatccacc cagggcaggc gggacctcga ccggagcgtc tttggacaga cagagcttga    780
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```

```
<210> 393
<211> 1938
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(1938)
<223> n = a,t,c or g
```

<400> 393
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aagtccttgg aagattaaaa gatgtcttta atgaagactt ttctaataga aaaccattta   180
tcaataggga aataacaaac tatcgggcca gacatcaaaa atgtaacttc cgtatcttct   240
ataataaaca catgctggat atggacgacc tggcgactct ggatggtcag aactggctga   300
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ccagagaaaa aaatagacct gaatcttcag ggttggcaga ctgctgttac gaagtgtatt   660
ccacaacaga aaaacgacag tgactgtgga gtcttgtgc tccagtactg caagtgcctc    720
gcccttagag cagcctttcc agttttcaca agaagacatg ccccgagtgc ggaagaggat   780
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agaatgcagc tgttctcaga gtaattttta agttgtcatt tccctgtgtt gcctcccaat   1740
tggaagaagt taaggtttac caaatgcatt tctatttcaa gggtatctga aacgtaaaca   1800
ttcaaaactg aaggctgact gacttnagat gtttttgcagg tggctggaga gaacagggaa   1860
ggtaatagag acacacttag tcccatggga agcgcagcac cgttgtaggt tctttctcct   1920
gtcccattag cgacctca                                                1938
```

<210> 394
<211> 1283
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(1283)
<223> n = a,t,c or g

<400> 394
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gacttttcat tttttgatca tgaccctgga aagagaaata tatttgacat caaaactcag   120
cacatatcct tggtctatat atacacatga aagtttcata aaacaataca ctgatatttt   180
ccatgctgta ttctatttca ttttttaaaa tgctggttgt atcccattaa actggtttca   240
aaataaatat aacatgtaca caacaacaac aaaaaaaaac actgggttag agggccagta   300
agctcagcga gtatcagcaa ctgagacttc atccttgtct cacaaggact aaaaagagaa   360
taatgttctc attatgtggt tcaatgccac acccatgtat ctgagatata catgtcacaa   420
tctgggagaa gcctgtcctc aatttacttt aaatacccaa ttctgcctag aacatgaatt   480
```

194

```
agacacatag taagctcttg agtgaagtgc agatgataat gacacgatca cataccactt       540
aaaaatatct taacaccttt acttagatct catctcatac ttgtagcatt tcttcaaatt       600
tactttgaaa aaagagcttc actgtgtgtg gttgtcatac acattcttct acccaaccat       660
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ggtactgagg aaggccttct ccaggacata gaggtctact cccttatcct ctggaagtgc       840
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agcagttgga agcatagtcc acaaaaaaga caactggggc agatattcca gcgcggcgac      1140
agcggaggag cgcccgggcc tcctgcaccg tccgccgtct gccaagccgc gcctccagcg      1200
ccgggtgccg gtagccttgg gaagcggtgc ttnnttncnn ggccttgcta gccccctggc      1260
tcattnnccc cggcccggtc tcc                                             1283
```

```
<210> 395
<211> 2149
<212> DNA
<213> Homo sapiens
```

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<400> 395
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ctggggactc ctaaatgtat ctatggctgg aatgatatat actgaaatga ctggaaaatt       180
gattagttca tactacaatg tgacatactg gcccctctgg tatattgagc ttgcccttgc       240
atctctcttc agccttaatg ccttatttga tttttggaga tatttcaaat atactgtggc       300
accaacaagt ctggttgtta gtcctggaca gcaaacactt ttagggttga aaacagctgt       360
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gttggcgagc tttagcccct ctcctccttc tccgtaccct accactgttg gaccagtgga       660
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gaaacagcat agggttaagc tggggagccc agattctacc tctccttcca gcagtcctac       840
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tatggattca tggacagcta aatttagaaa ttggatcaat gagacaatat tagtgccact      1080
tgttcaagag attgagtctg tcagcacaca gatgagacga atgggttgtc cagagctaca      1140
gataggagag gctagtatta ctagcttgaa acaagctgcc ctggttaaag cgcctctcat      1200
tccgactttg aacacaatcg ttcagtatct agaccttact ccaaatcagg aatacttgtt      1260
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ctggtgtgaa tatattgtgg atctttggcg agtagcaagt catatattta attctgacat      1740
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gaaataaaat acacatgggt gtatgttaca gactctttag atttaacaga aaatgtagct      1860
gttatgaaat gtaattgtaa aaatatgtcc cgtatcttct atatcgagac attgcctta      1920
attttatatc gcttttcaga aatttcagtt gactacaaaa ctgcaaccct tcggattttt      1980
attgactcaa aatagtgcca ttcccttaa tgaaatagat tttgagtctt ttttttcattg      2040
taacccccaa atgagaatca tctacctgat tcttgtacca aaaaaaaatt tttttcagtc      2100
```

ttttttttttt ttaaagaggg tttttgccaa cccaaactgg agggcaggg   2149

<210> 396
<211> 1895
<212> DNA
<213> Homo sapiens

<400> 396
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actgccaagg aacagggaat ccattctttg gaagtcctga tcacccgaga ggatgacttc   180
aacaacaggc tgaacaaccg cgccagtttc aagggctgca cggccttgca ctatgctgtt   240
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<210> 397
<211> 2416
<212> DNA
<213> Homo sapiens

<220>
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<223> n = a,t,c or g

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          gacaaacagg  caactctagg  acctttacag  tggcgatcgg  cctccacnac  agcaaaatgc      180
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```

```
          <210> 398
          <211> 1495
          <212> DNA
          <213> Homo sapiens
```

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          ccaagctgtc  agctaaaggc  agtttccccc  atttcacaga  atatgtggta  gaagttccga      180
          gtaaggaatt  ttttcagcag  ccatgaaagc  tccctgcata  aggaagactc  agtgtgcaac      240
```

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atctgaaagc agtattgcca gagcatgact gtggcaatga agcaaaatgt tccctccacc       300
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agtgtttgct gaaagagcta atacataagt caaccttcac tggtaccaat gaaggcttcc       420
cagttcaaaa ttcaacaccc agaaaaggca gaaattttag ctttaaatta agtttaaatt       480
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aaggagattg tcctggccac agaaagtaga ttgatgagca tcttgggtag aatgacaaag      1440
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```

```
<210> 399
<211> 2752
<212> DNA
<213> Homo sapiens
```

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cagccgcagc cgccgctgcc gccgaacctt accctgtgtc cggggccaag cgcaagtatc       180
tggaggactc ggaccccgag cgcagcgact atgaggagca gcagctgcag gaggaggagg       240
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tcgtgtctca cgtggacccc atccacatct tcgagcgccc catcgtgtcc gtgtccttct       660
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198

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<210> 400·
<211> 2354
<212> DNA
<213> Homo sapiens
```

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```

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```

```
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        <211> 3455
        <212> DNA
        <213> Homo sapiens
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atcgcatggc gctcagacat tttaaccgga actgatgtat aatcacaaat ctaattgatt   2100
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gttttatta tggctaccta tgtgtttgta agcaggtata ttgtatatta gtgtattagt   2340
aatactagat aaatgaattt tgtctgggga ttaagattgg atagttaata gattaataca   2400
```

```
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tatcaaaata tgtttgggtt tagattttaa gttgtctact gagcagattt ctgcattggt   3360
tttccagtcc tgttaaaagt ttagaaactt catatgtgtc atcacagctt ttgtaaagaa   3420
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```



```
<210> 402
<211> 1266
<212> DNA
<213> Homo sapiens
```



```
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tttcgttcca ttttccagca catacaatca gctcagtctc agcgtagccc ctcagaactg   180
tttgcccaac atatgggtgc ccattgttca ccatgttaaa gagcatcact ttgggtcctc   240
aggaatgaca ttacatgaac gctttactta aatacctaaa aagagggaac tgagcaggag   300
gcagccaaaa acaagaaaag cccagagata cacaggagaa tagacatttc ccccagtaca   360
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agaggc                                                                 1266
```



```
<210> 403
<211> 1006
<212> DNA
<213> Homo sapiens
```

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ccaaatgctt catctgtggg ataggcaatg attacttcga cacagtgcca catggctttg      180
aaacccacac tttacaggag cacaacttgg ctaattactt gttttttctg atgtatctta      240
taaacaaaga tgaaacagaa cacacaggac aggaatctta tgtctggaag atgtatcaag      300
aaaggtgttg ggaatttttc ccagcagggg attgcttccg gaaacagtat gaagaccagc      360
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tctcaatttc tctgctctct tggaaacatt ttgctgattt tgtgaattgc cagcgttgtg      480
tgttttctgg gagcatcgaa gctctgtttc ggaagagctg tttcctcccc ccaccttttg      540
tatttacttt gagactaaag actgaagaat aatctaaatt catactcaga caaaaaaagg      600
aattctggaa agaaaaccat tctggacact gtcataacac acatagatag attttcttct      660
gagactcccg gagtcttctc gagctacgag accttcacag agacacgtgg cagccacact      720
cacccagcct cctttatttca ccatcctgga aggaaactgt ctgtctaatg gtcacagagc      780
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tcgacctttc ttttcttaga ttgattttgt gaggttttt tttttttcctt tagcctttc       960
tttaggggg gagggtaaaa aaagcagttt gcccttaaaa aaaaaa                     1006
```

```
        <210> 404
        <211> 3115
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 404
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ctccgagcct gggcttcctc aagagcgtgg cccaagggcc ccacagccca gatccgggca      180
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gggaggcaga tatacacaaa cgcgcctcgg cccagcttgg ggctggcggg ggaggctgtg      300
tcttcaaacc tttgccccca gttgggtcag tagaaccacc agtgtcctcc ccttctacct      360
cccagctcca ctttggaggc tgaggaagcg agaggttttc taggcagatt tggagccctg      420
gagattgagt tcacagtgta tgttctgggg gcgctggtgc agtcagcggt ccagtctcca      480
gcctgcaggc gtgcacactg gggtggacga tgggtggccc cgcaggtgta cacatttggg      540
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```

202

```
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tgttgactgg caggaactcc acgccttcct ccaagccatt cactttctcg tgccgggagt   3060
tgtacttgag tcccgcgccg aagtccttcg ggccccctcc gcccttgcga cgaaa        3115
```


        <210> 405
        <211> 1264
        <212> DNA
        <213> Homo sapiens

        <400> 405
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tttaacgcca tgtttgaaca tgaaatggaa gaaagcaaaa agaatcgagt ggaaataaat    180
gatttagacc ctgaagtttt taaagaaatg atgagattca tttacacagg gagagcacca    240
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tattaatagg tgcagtgtac ttcgacaact tgggtgtaaa gatgggaaaa actggaacag    480
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gtaagttatg gcaatacact gcttcaattc taatttatt ttcatttcag ggggcaaata    1200
tgcaatgagt tggcctagat ttttagtgac atttatgatg tttgtcttgt atgttaactg   1260
tcca                                                                1264
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203

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<210> 406
<211> 2001
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(2001)
<223> n = a,t,c or g


<400> 406
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cagacatcag accctgtcct caggatgtga tggggcccct cccccatctc ccatcctacc   180
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agccacccaa cccaggtcct ccagaggcct tgctggacag gaagagggtg aggcgtgagc  1920
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cgaacaaann nnnttgtcct a                                             2001


<210> 407
<211> 1652
<212> DNA
<213> Homo sapiens
```

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ggggccccaa aattaaattc cggggccggg gtttaaaaac ggggggaggg gaaaaacccg  1620
ggggttaccc aatttaatcc ccttgggaaa ag                                1652
```

```
<210> 408
<211> 668
<212> DNA
<213> Homo sapiens
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<400> 408
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cctcatctac cacagctggt tccaagcagg taggtagggc tttggaggcg cctcctcaag   360
tccgggtccc caatctgagc taagacgact ccatggggag ggtggggtct acgactgagg   420
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ccagtactac ttcggctcgg taaacgcctc ctacaacgcc atcatcgact gcggaaactg   600
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atgccgaa                                                           668
```

```
        <210> 409
        <211> 1854
        <212> DNA
        <213> Homo sapiens




        <400> 409
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gggaaagagg caaagggaga aggccctgtg tgggactcaa acttgctcac ccctttctg    180
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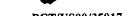


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        ctgtgctttg gacatttgaa ttaatgtaaa tatatgtaat ctgtgacttt gatattttgt    2460
```

```
tttatttggc tatttaaaaa cataaatcta aaatgtctta tgttatcaga ttatgctatt   2520
ttgtataaag caccactgat agcaaatctc tctcc                    .          2555
```

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        <210> 416
        <211> 2950
        <212> DNA
        <213> Homo sapiens
```

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gacaactggg ctcctctgta aatatacagc tcaaaggttc aagccaaagt ataaattctt   180
tcacaagtca ttccaggagt acacagcagg acgaagactc agcagtttat tgacgtctca   240
tgagccagag gaggtgacca aggggaatgg ttacttgcag aaaatggttt ccatttcgga   300
cattacatcc acttatagca gcctgctccg gtacacctgt gggtcatctg tggaagccac   360
cagggctgtt atgaagcacc tcgcagcagt gtatcaacac ggctgccttc tcggactttc   420
catcgccaag aggcctctct ggagacagga atctttgcaa agtgtgaaaa acaccactga   480
gcaagaaatt ctgaaagcca taaacatcaa ttcctttgta gagtgtggca tccatttata   540
tcaagagagt acatccaaat cagccctgag ccaagaattt gaagctttct ttcaaggtaa   600
aagcttatat atcaactcag ggaacatccc cgattactta tttgacttct ttgaacattt   660
gcccaattgt gcaagtgctc tggacttcat taaactgggc ttttatgggg gagctatggc   720
ttcatgggaa aaggctgcag aagacacagg tggaatccac atggaagagg ccccagaaac   780
ctacattccc agcagggctg tatctttgtt cttcaactgg aagcaggaat tcaggactct   840
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aatattcagc tctgccacaa gcctcaggct gcaaataaag agatgtgctg gtgtggctgg   960
aagcctcagt ttggtcctca gcacctgtaa gaacatttat tctctcatgg tggaagccag  1020
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gaagtctaag agaactctct catctaaata tatttaagta gaggcaagcc tgaaaaaaac  2700
acaaaaacct aaatggtgtt aggctgtggt tcacctattc tcatggcacc tcaaattaat  2760
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```
ttctgggcac aacatccgtt tagcaattgg gcatacattc tacagattta gccataacgt   2880
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gaaagctcag                                                          2950
```

```
<210> 417
<211> 850
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(850)
<223> n = a,t,c or g
```

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<400> 417
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gatacacaga atgctttcca ttgaatcatt tggtcataat ccgggtacaa agcaaattta   120
acacgtgtga gagatgcaga aaaaggtccc ttctatgtac accttgccaa atacaagaac   180
ataaagaaag aaaaaagcaa agtttaagcc tttaggtcat ttgtaaaatg ttgccaaacc   240
catgctgcta cttttaacag agaagtctga gttttaaaat tcaaacgttc tttcttaca    300
aagaaaaagt gcctctatct gccaagcgca tgatcttatg agcttcagat agaaaagtgg   360
ctatgacttg tgactgtttt tggttcagaa caatgctaga tcaacatgca agttgtatgg   420
aggtggggac agaaagggag cggcaggctg gggtggctgg taatgtttga tccctctgga   480
tttcccacag gagaaaaggt tctgcaggac gatgagttca cctgtgacct cttccgattc   540
ctgcaactac tctgtgaggg acacaactca ggtttgtgag tccccggaac ttctgatgat   600
actaaggcat aaataatgtt ttcaagccag taataacaag agcctgttag ttccaattat   660
gcatcgttct agagacagca aatcattcta gagcatggct ctgcattggg atctgggncg   720
ttttatnttt ggggtccgcg cacgtccaca atntcaaann nncggcgccc aggggtcccg   780
cccccccgaga cgaattagat agatggaagg tgtgaatggt ggtaaagatg gacaaagtga   840
tgcggggtgg                                                          850
```

```
<210> 418
<211> 360
<212> DNA
<213> Homo sapiens
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```
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aggcgtccag gtgagtagga catccagaag atttggactt ggagatgttt cccctatt   180
tgagtgtcca gattaagagc tggctgccct agtcatttta aaacatgctg ggaatccaag   240
ttgggtctcc tcattttaat gatgtctagg ctgagggctg ggcctttcat tcttgagtcc   300
ctgggctcag aagtgggtct ctttccctcc tctcagggta ctgaggaagg accccaggtg   360
```

```
<210> 419
<211> 949  '
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(949)
<223> n = a,t,c or g




<400> 419
atttgatggt aatttgctgg gattacaggc gtgagccacc acacccggcc ggaagatatt    60
aattcttata tgtgtatgtt caacagatac tgaatctcag gtgaagcaaa gtgccttcat   120
cattgtagca aatcctacat ttaaatgaaa tcagataagt actggcatat aatcaaaatt   180
tatttttttat gttgattccc aatcaatgat tttttttttt caaacaccaa caagacataa   240
agtacttatt atggaatttt gtccatgtgg gagtttatac actgttttag aagaaccttc   300
taatgcctat ggactaccag aatctgaatt cttaattgtt ttgcgagatg tggtgggtgg   360
aatgaatcat ctacgagaga atggtatagt gcaccgtgat atcaagccag gaaatatcat   420
gcgtgttata ggggaagatg gacagtctgt gtacaaactc acagattttg gtgcagctag   480
agaattagaa gatgatgagc agtttgtttc tctgtatggc acagaagaat atttgcaccc   540
tgatatgtat gagagagcag tgctaagaaa agatcatcaa gaagaaatat ggagcaacaa   600
gttgatcttt ggaggcattg gggtaacatt ttaccaaggc aagcctactg gatcaactgg   660
ccatttaana ccccctttgaa ggggcctccg tanggaataa agnaagtgat ggtataaaaa   720
taattacagg gaaaggcctt ctgggtgcaa tatcctggag tacagaaaag caagaaaaat   780
gggaccaatt tgactgggag tgggaagaca tgcctgtttc ctgcagtcct tcctcggggg   840
tcctcaggt tcctaactta cccctgttc ttgcaaaaca tccttgaaag cagatcaagg   900
aaaaagtgtt gggggttttg accaagtttt ttgcaagaaa actagtggg              949
```

```
<210> 420
<211> 986
<212> DNA
<213> Homo sapiens




<400> 420
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gggtgaaaac agcatctcac tggagtctca aaagtgtatg aatcttctgg tagtgcaagg   120
atgggataag atggccaggg aagtcagatg gaaatcccc aagattcttt ttgctactga   180
tttctataat taaaatatga catatgtaag ggactagtgc atgatattca ataaatgtca   240
gttgtctttc ctaactaggt tcctcacagg ctaggttatg cctagatatc atcatcctcc   300
tttcagggaa tgaagctcac ctagaaaact agggaactaa aagtgcaata tggtttgggt   360
aatgcagttg gttagctgtc tccccatcct cccaactcac tattccaggg aggggctgaa   420
aacagaagtg gctccctga agtctagtta gcatgtcatg acagagtcca catgaagggc   480
tgtgggctgc aactttctag tgcacagtcc tctctttttg gcgatgataa ttgtagggaa   540
agaagcgcac acgcatgctg atttcacgag ctgtcttcag gatctcaaca gccttgctgt   600
gctcaatatc ttggaaatcc acatcattca cagctagaac ttggtcccct tcctgcagtc   660
ctgctctatg tgcatcagag tcaggaatca ccttggagat gaagatgcct agctgggagg   720
cctttcctcc tcggatgtta aatcccaact gagctccagg aggcttcttc agtgtgatgg   780
ttcggggcag aaactgggtc aactcattgt tgtagtccgg gtggtgtacc ctctcatgag   840
gaggaatcca tgctggagga ttctcatagg caggcaagaa aaccaccggg tagtcatcat   900
aaggaatccg gctgtccatc tcgggcaagg cccagtgggc agtccacagc gacctcagac   960
tccgctcaca cgaaatcgtc gacccg                                        986
```

```
<210> 421
<211> 1209
<212> DNA
<213> Homo sapiens


<400> 421
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cgagagagaa gcttccttgg acagaatttg ctgagtcagc agaggatggg cccaccacca   180
gattctgtca gaagctggcg aagaaccatg acatggtggt ggtgtctccc atcctggaac   240
gagacagcga gcatggggat gttttgtgga atacagccgt ggtgatctcc aattccggag   300
cagtcctggg aaagaccagg aaaaaccaca tccccagagt gggtgatttc aacgagtcaa   360
cttactacat ggagggaaac ctgggccacc ccgtgttcca gacgcagttc ggaaggatcg   420
cggtgaacat ttgctacggg cggcaccacc ccctcaactg gcttatgtac agcatcaacg   480
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ccatcgaggc cagaaacgca gccattgcca atcactgctt cacctgcgcc atcaatcgag   600
tgggcaccga gcacttcccg aacgagttta cctcgggaga tggaaagaaa gctcaccagg   660
actttggcta cttttatggc tcgagctatg tggcagcccc tgacagcagc cggactcctg   720
ggctgtcccg tagccgggat ggactgctag ttgctaagct cgacctaaac ctctgccagc   780
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tggaaatgtt tggggactag gtagaggtga atgtactaaa tgccactgaa tttgtatact  1140
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aaaaaaaaa                                                         1209




<210> 422
<211> 5214
<212> DNA
<213> Homo sapiens




<400> 422
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tataacaatt ctacaagcca atcagacagt acgtgacatt tcaatgagta aaaaagagca   180
taaaactgta tgtgtaagaa caaaatgtta aaaggcctac cacaataata aaaaaccgtc   240
aattacatca tcacattaaa ataagccaga tgtacaaaag tctgagacag agaagacaaa   300
aggacaacac aagatatttg ttgaaaaatg tttgtgctct ttgggcactt aattaaacat   360
tgcaaaatca acatcatctt cttcttcatc agactctgca aaatatttta cttctttcct   420
agcccgaccg gttcgtggca gagaaggtgg ctcagtaggg aagtctgagg ggaagatgtc   480
cacatctgaa tcctgatcaa aagatgtctt cttcggtttc ttgcttgttt ttttggatgt   540
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ccctcggcct ttaccttttg gtgttgtagt cttcttggaa atgccaaatt ctgaatccga   660
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ctgtttcaga ccaaatgatg gtgaaaaaac agaagcagaa tcttcttcat tactgtcaaa   840
```

214

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tttagctgaa tcatcttctg acttctgaga atatgaagga aatgagaaga gatttccaaa    900
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aaatgtatat tcatctttat ctaacccatc tgaaggaaca aattcatctt ccccatcatt   1020
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acgaccacct gtaacttttt tctcatcatc atcatagtta ctggatgtta aaagctgtcc    4740
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cccattattc caaatgctta taatgttaga ttcaggatca atagaaactt taatacaagt    4860
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ccacatgaac tgcgtcaatg gctccactga cccaatatat gtatcaggac gaagaagaat    5040
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```

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        <210> 423
        <211> 474
        <212> DNA
        <213> Homo sapiens
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```
        <400> 423
aagggttgtc tggctgcctc cttcaactgc atcttcctgt atactgggga actgtatccc     60
acaatgatcc ggtgagtgga agcctaatgg gagaatgaca gccttttcct ggggaaagac    120
attcttctgt gcacaggtca gacccagag ctaaatcaag tacatcccag cccaaaggcc     180
cctcccaaca ctcatcattg caaggcacat agtagccact gagtacacac ctcatggcct    240
agctaacaca ggtgttactg tcctctaagc ccttacggga ccctagaaga tctcaaaagt    300
agccaccaac tggggcaggg taaggaacca agaagacaca tctcagagac aacaaatcga    360
agtcttcctt taatctccaa aacacaaatt agaagctgcc accacatcta cattccatct    420
ataaaccaag tgatatatct gaaagcaaag gccacaaaca tgaaagcaat ttcc          474
```

```
        <210> 424
        <211> 1453
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 424
tttaagttga gaactttcac ctttttcattt aaaaggaagc actttgtggc ttctctttgg     60
catatccgaa tcaccagcat catcactact cctgctctct ggggccactg ttaagcaaag    120
tgaggactgc ttggtcacag gcactgtgaa tgctgggata gttgatctga tcaccaagac    180
ggctactaag tcactagcag ggtgggtggc gtatacagcg tggatgtgct ggaccaaggg    240
atgactcaca tccccggccg gctggagccg gacagcgaga gatttcatca cgctactcag    300
aagggcacac catttgagac ttaaaattct ttatttctgg aattttccat ttaatatttt    360
tgaactgcag ttgactgcag gtaacaaact gtggaaagcg aaaccataga tacgagcggg    420
ctactgcgtt caaaaggctc ttcaactgtt gtggatcctc tgatgttctc ggagatggtt    480
taggtggtta catgccttcc cgcactcctt acattcgtag gatttcgccc cactgtgcgt    540
tttctgatgt tgtgtaagct gatggccgtg actaaagctc ttcccacatt ctgtacaccc    600
atagggtttc accccggtat gaattctctc atgtttcacg aggctcgatc cataaatgaa    660
agccttccca cactccttac atttatacgg ggtttcgcct gtgtggattc tctcgtgctg    720
agtgaggtga tagccacaat tgaaggcctt cccacattct gtgcacttgt acggcttctc    780
gcccgtatgt atcctctcgt gcttaacgag gctcgaaccc cagcgaaagg ccttcccaca    840
ctccttacat tcgtgaggct tctcaccggt gtggatcttc tgatgctgag taaggtaatt    900
gactcgagta aaggccttcc cacattcttg acattcatag ggtttctcac ctgtgtgaat    960
tcttttatgc tgaatgaggc ttgaaccaca aataaaagcc ttcccacagt ctttacactc   1020
```

```
gtaaggcttc tccccactat gaattctctt gtgctgaata agtttataca cacggctaaa     1080
ggtcttccca cagtctttgc attcgtagtc tttctcccca gtgtggaatc tctggtgctg     1140
agtgagctca tcaccacgcc gaaaggcctt tccacagtct ttacattcat agggtttttc     1200
accagtatga atcctcttat gaataacgag gcttgagccc catcgaaaag ccttcccaca     1260
gtctttacat tcgtagggct tctccccagt atgaattttt tgatgttgag taagctgatt     1320
gccccaacgg aaggccttct tacattcttt acattcataa ggtttctcac cagtatggat     1380
tttctgatgg tgactaagtt gatagccacg actaaaggcc ttcccacagt ccttacattc     1440
aaaggaattc tcc                                                        1453
```

```
        <210> 425
        <211> 1131
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 425
gtttccctca tgattttatt gtctcctggg gaccctgctt tgggcggtct ggatgtctgc      60
cttgggccta gtttgaggcg ccccgaaggt ggagccatct tggtctcgta atttgctctt     120
ccctgccccc caagagggaa gccagagcta gcggggccag cactgctcag gaggcaaggt     180
ggcctacctg tcgcacaccc ggaggaggaa atcattgacc aggctctcgt gccggctgca     240
gatgcttctc ttggaaggca ctcttgagcc agtcctcaat gctgcacacc tgcacgcggc     300
tggagtgcca gcagatggag aggctgcgga gtgccgggcc caggaggaag ttgtccttct     360
ggagttcagt gagggaacgg aagtgcagca gggaccagag tgcggggtcc tcaaacacgt     420
cgtggagctg ggagcaggtc ctggcaaggc tcttcctgct gtccttgtct aggaaggaga     480
agaggtgcag caggcactcc cggttgagct gggttatgtg catggtgagc agtggccaca     540
tgtcacttca tcctggccca ggtactgcag ctccaaatcg tggggattct gtaagagctt     600
gctacctgtt gactgaggag gcccacgagt tgagaagaac tagcaagagt ggtacaaaac     660
tgcaggtcat tgggctggcc accaggtatt cccacccacc agaagctggc tgttgtactc     720
acccggaacc atggtgcacc accacagcgg cgaggtcata caggcagctc tccgggccac     780
tgttctcagg ctacagaaca aggaagaagg agcagtggtc aatgacatca gtatctcgat     840
gacctctacc ctctccatgt gatgacaatc ttactgaaga gccatttttt caccatgcta     900
aaaaggccag ttgggtccag cagctttgcc tctctaccct tttatcacca aagtatactg     960
ctgagaaaga atcaaatgaa aagaaaaaag actcaacaag acctcactca tattaactgg    1020
actctacaag cagtgagcat ccagacctgc atttggttac aaaagaagcc ttcaagctat    1080
tttcatcagc ttcctaatca agttaaaaaa taaaccacaa aactgagaaa a            1131
```

```
        <210> 426
        <211> 551
        <212> DNA
        <213> Homo sapiens
```

```
        <220>
        <221> misc_feature
        <222> (1)...(551)
        <223> n = a,t,c or g
```

```
        <400> 426
gcttgggctg tcctctgatg ccatgttgtc agcccagaca ggcagtgtga tcagggctcc      60
tggcagaggg tctcttgaga cacagccact gccctgctt ggtggtcgtg acttgggacg     120
```

```
cagcctgcct gtgactggag ctgggggtga cgggtaagat gagtggagat gttgggccag    180
tggggcctga ttcccagact ggaccaaacc ccaggggctg tcctccaatc cggaccatct    240
tccagagctc tccggatgcg cttgtgaaca gcaagttact aggaaacctc tgctgcgtct    300
gcacgtccat caccagggag atgtagccct cgatgaggga gaaggagaag aagcggatgt    360
ggccgcagtc atccccagtg gccatggggt ccttcactcc attggagtag aacatgacat    420
ccatgaggag tgtggcaaca gcaggcagcg tgtcagggtc caggctggtg acacagaacc    480
tgttgctcgg gctggccgaa ttccaccacn tggactaagg tctactatna ggggcctcaa    540
ttggacgtgc c                                                        551
```

```
        <210> 427
        <211> 1579
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 427
agtcacctcc agaccccaga agctctcccc aacccagccg agttcctctg caaacaattc     60
aaggggctct gataggtcac acagtgccac cttgtgtgct ggaccatatc tggagggaga    120
actgagtgag ggggcacagg ggattgtctc caggtggggc gagcagggga aggaaaatag    180
tggccacttt tacattggtt tgggtagtaa ttattgattc aggaagcaaa tacaaaatcc    240
tgaatgaaat gacttggaaa aagtaaatag aatcaagatc ccaagaggag ctgaagataa    300
ataaatggga gcaggatgtg ggggaatggt cggtaagtga gaaatgctaa aatgatagaa    360
taaagcttaa ggattgttgg aggtagagca ggaactgtgt actgcatagt tcccaaatgc    420
cctggtgttc caatggggga tggaaactaa aacactggcc aggttggatt tcatactgta    480
gtcctgccat ttttcttcct agagcagaga taaaagttgg ccctgggcga tagctcattc    540
tctctgaaag gctgctagtt aggcccagcc tgtcaccctg gatcatgagt gtcgtgtgta    600
ttgggactta cggcagggggg ctgaggcttg cagatgggca agtggtgaga ggccccactg    660
acctcagtct gtttctcact ggagcgcagg tttgggagca gcagcaacac cacatccttc    720
ggcacgctcg cgagtcagaa tgcccccact ttcggatcac tgtcccaaca gacttctggt    780
tttgggaccc agagtagcgg attctctggt tttggatcag gcacaggagg gttcagcttt    840
gggtcaaata actcgtaagt atcccccttt ttgagtctca ccttaattaa aagcattaaa    900
taaggttgga agtgtgtgga tcttgctgga tttgtgcatt ttctttttcgt tttttcctgt    960
ttttagagtt tgtcctggaa gtgtgggggt tcagcagcag ggtttgggtt ttgtggactt   1020
gctcttctct gtagcaatat ggcaggaggt gccaggcctc gccttcttaa gaggcgtggt   1080
tcaaagagaa aagagcacgc ctgccagtga gctgggcctg agggcagcgc tgaggagatg   1140
ctgctcctga cttccctgga ggtttctcag aagctgcatg ctaacccctg ggctctgggc   1200
catcaccagg tctcatgtgt tgatccaccc tctgtgcttc tgtgtaaaat ttcatggcgt   1260
taaaattcag tcttagccag gtgggtggtt cacgcctata atcccagcac tttgggaggc   1320
tgaggtggga ggattgcttg agcccaggag tcaagaccag cctgggcaac agagtgagac   1380
cccatctcta ctaaaaatta aaaaaattag ccgtgcatgc tggcttatgc ctgtggtccc   1440
agctactcca gaagctgagg cgggaggatc acttgagcct gggaggttga ggctgcagtg   1500
agccaagatg gtaccactac cgtctagcct gggtgacagc cagaccctat atcaaaaaaa   1560
aaaaaggggg gggcccttt                                               1579
```

```
        <210> 428
        <211> 413
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 428
tcgaggagcc ccagggtagt cccatctggg tatggctggc tgggtcacta acttctgtga    60
gctgcttcct tcctttccag aggatgcgga tcaaacctca ccaaggccag tacataggag   120
agatgagctt cctacagcac cacaaaggtg aatgccgacc acagaaagat tgagcacgac   180
aagaaaatcc ctgcgggcct tgctcagagc ggagaaagca tttgcttgga caagatccga   240
agacgtgtaa atgttcctgc aaaaacacag actcgcgttg caaggcgagg ccgcttgagt   300
taaacgaacg tacttgcaga tgtgacaagc cgaggcggtg agccgggcag gaggaatgag   360
ccttcctcag gggttcggga accaccttct ctcaccagga aagactgata cag  ·       413
```

```
        <210> 429
        <211> 1567
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 429
cccacgcgtc cgctccaggc tcctggagtg cctcatgctg gctaagttct ctctgggctc    60
ctccaggggt tctgtgtgct cttggaggtc cctctgctag tggtggctaa ctagagagtc   120
agcaggggg tgactgggaa agagggagag gtgatgttgc ctgctactcc cctccttgcg   180
gaccctcata ccacatgacg tggcggcgtg gggccaggaa ctagggaagg cagaaggcgg   240
gcgcagtggg cagctctctg ggctcagctt gctgaggggg cctcctgtcc tggctctttc   300
tgggagacct cattcttctg cccatgttcc tgcctcacac attccccgtg atgaacgctg   360
tgggcggggc ccggcctgtg ccctcagtcc cacagctcct ctagtgtacc tgccccgtgg   420
gaaccccatg tggaaagagc cctcagaact gacaggaatc agggacagag gcccttgctg   480
tcagcctcct gggcacctgc acctgccagg cctctctttc ttaccagccc agtgctgctg   540
ccaaaatcca gggctatccc agctgcccgg gaccccagtt gagccgggat attttgtctt·   600
ctggagatgg ctggtgggca ggcctcagtg gtcatcatag ggtctgcggg ggtcctgggg   660
tgcaggtggg gctcctcagg gaagagccat agtctgtccc caagtcggaa gggtaatctt   720
catcttctct cacaggagcc acaaaccact gtggtacaca acgctacaga tgggatcaag   780
ggctccacag agagctgcaa caccaccaca gaagatgagg acctcaaagt gcgaaaacag   840
gagatcatta agattacaga acagctgatt gaagccatca caatgggga ctttgaggcc    900
tacacgaaga tttgtgatcc aggcctcact tcctttgagc ctgaggccct tggtaacctc   960
gtggagggga tggatttcca taagttttac tttgagaatc gtgagtgggt tcgtgctgct  1020
gatatactcc tgcctgcccc tttaccccgtt tgtctctgtc tcctgctcac cttctcatcc  1080
cagttgccca cttttccctt atttgacctt cgtgctgcac tcctactctg tatgcttgtc  1140
cccttgtgcc ccgatggttg tagacaggca ccttgaagg ccctgctcct gagctccaag  1200
tgccattcat tctgcagctg ctttgtggca gtgccagtca ccacaatcaa gctcacttat  1260
ttcttgccgg gcgcggtggc ttacgcctgt aatcccaaca ctttgggagg ctgaggctgg  1320
cggatcacga ggtcaggaga tcgaggccat cctggctaac acggtgaaac cccatctcta  1380
ctaaaaatac aaaaaattag ccgggcgtgg tggcggtgcc tgtagtccca gctactcggg  1440
tggctgaggc aggagaatga tgtgaacctg ggaggcagag cttgcagtga gccaagatca  1500
ggccactgca ctccagcctg gcaacagag caagactcca tctcaaaaaa aaagaaaaaa  1560
ttattta                                                            1567
```

```
        <210> 430
        <211> 728
        <212> DNA
        <213> Homo sapiens
```

<400> 430
```
ctttccacac catggtccaa gggaagggct gccctgtctg aagagtcccg cccacttgta      60
ggatgagacg tggaaaatat tgttgctgta acttaaaaaa caagaccagg ggggttggct     120
gggagcaccg gccagcaggc cctgctgagc ataaaccccc tccactggag aaggcgtggc     180
ccctgcccac ctggaccctt ctggaaatga gggaagtgct aacagcagtg cccatcccac     240
aagcattaaa ctcgggaggt ggagactctc cagcagaaag ctgggcagca gagtggtcct     300
gcccctcggc ccacaaaggg ccttggccga gcatgggcat gcctggtgtg tgcccactgg     360
ggtccatccc tgccagtggg gttccaggga cctcggggac cgggctgctt gggcccttgg     420
actctaggtg agccgtgaga gcgggctggg gcaggcggag cagctgcctg cagggcaggg     480
acacggtcag gggctacctc ccggacaccc tggcctctcc acaggcagct atccatgatg     540
ctgatgctgg cgcagtcaaa cccgcagctg ttcgcgctta tgggcacccg ggcaggcatc     600
gccagggagc tggagcgtgt ggagcagcag tctcggctgg agcagctgag tgcggcagag     660
ctgcagagca ggaaccaggg ccactgggct gactggctac aggcgtacag agcccggctg     720
ggacagga                                                              728
```

<210> 431
<211> 1524
<212> DNA
<213> Homo sapiens

<400> 431
```
gaaatggtac tcttttcatc atggtgatgc atatcaaaga tcttgtgagt gattacaaag      60
aatgatggtt gtagaggaaa cccttacctt ggtaggaagc attactatta agggactgct     120
ttttttttta ggttactgaa aatggagctg acccaaatcc atatgtcaaa acatacctac     180
ttccagataa ccacaaaaca tccaaacgta aaaccaaaat ttcacgaaaa acgaggaatc     240
cgacattcaa tgaaatgctt gtatacagtg gatatagcaa agaaacccta agacagcgag     300
aacttcaact aagtgtactc agtgcagaat ctctgcggga gaattttttc ttgggtggag     360
taaccctgcc tttgaaagat ttcaacttga gcaaagagac ggttaaatgg tatcagctga     420
ctgcggcaac atacttgtaa actagtgaat gtctgagctt tggaagcatg aacagttata     480
aacgtgcatg catacatgca cacacacaca gacacacaca cacacacttg ttaattttgt     540
atagtatttt tatacttgga cagaacttat aaagttaaat atacttgctg catttcaaca     600
catctgttgg accaacagtc acataactaa ccttttgaa tttttggaag ccattgctgt     660
tttaaagtca ttatgtagaa tgctacaaac cctaaactta atatatacta attcctgaaa     720
aagactttga gacagtacta tgtcagttca gccacctatt ttgcattgtt ttctataagg     780
aggcaaagca tatgtgtttt cctgttatgc accttttata gcctttacca ctgtgtaatg     840
ttcacaaaca ccaaagtaaa ggaaaaatgc aggatgttac cgtaaaatcc agctgctatt     900
catggagctg aaaaacaaag cacaaataat agatagctaa gttaagaact actaagtagt     960
ttatagaagt agggaaaaac gtaatactgc ttttattca tgtctttaaa gcctttttca    1020
gaataagtgc caatcactga tgttgtaaat aatggtgcct taactttata tgcttccctg    1080
gcacttcgtt tctgattttt ttcctgattt gataaataat tagtacatag ttttcactca    1140
cttgcagctt actaaagaca agaaattatg tacatgtact aatgttttc ccacaaaaaa    1200
atcctttact tctgatgtat gaattagtta tctaaatagt taagcctaat acctgaataa    1260
gactcaccaa tgtgattgta caataaattc tatcattcca ttaaaatcct acatttattc    1320
ccaggaatgg taatttcacc tccctacatc tatactccac tccctcagta aataagtgaa    1380
aattgttaac ccatgtgccc attcctgagt agggcagact cttcacaaga ggcccatgac    1440
aagaattcta gggtccagat tgaactttaa tatagacctt tgtctgtgta gaccagtttg    1500
tcttgtaaac tgtcttactt atgt                                          1524
```

<210> 432
<211> 1908
<212> DNA
<213> Homo sapiens

```
<400> 432
gtctctatgg aattatagct cacctacttt tgggggaatc atgtaaggta attttatttc      60
attatgtatt actagaatgt attgttttaa aatgtgtcta cttttttgaa gtgtcatttt     120
gttgttgttt tcattgagat ggggtcttac tatgttgccc aggctggtct cgaactccga     180
acctcaaatg acctgcccgg ctcggcctcc caaagtgctg ggattatggg catgagtcat     240
tgcatccaga caaaagtgtc attgtttaat cttgatttga aagaacttta ggtatttaaa     300
acattatgtg gttcttttgt gcaagcgctt tatccctaag tcgtttgatt atccagggtt     360
gaaagcaact ctctctgact tctgcactca gaaagcgctt ggtctaattg tgttctcctt     420
cctgtctctt agcttcacag gataatgcag ctggctgtgg ttgtatcaca agtacttgag     480
aatggttcct cagttttggt ctgtttggag gaaggctggg acatcactgc acaagtgaca     540
tccctggttc agttactcag tgatcccttt tataggacac ttgaaggctt ccagatgttg     600
gttgaaaaag agtggctctc ttttggtcac aaattcagtc agaggagcag cttgacccctc    660
aactgtcagg ggagtggttt tgctccagtc ttcttacagt tcttagactg tgtacaccag     720
gttcacaacc agtatccaac tgagtttgaa ttcaatctct attacttaaa gttcttggct     780
ttccactatg tgtctaatcg ctttaaaaca tttctcctgg attcagacta tgaaagatta     840
gagcacggaa ctttatttga tgataaagga gaaaagcatg ccaaaaaagg agtctgtatt     900
tgggaatgta ttgacagaat gcacaagagg agtcccattt tctttaatta tttatattca     960
ccattggaaa tagaggctct aaagcccaat gtaaacgtct ctagcctcaa gaagtgggat    1020
tactacatag aagagaccct gtccacaggc ccttcctatg actggatgat gctaaccccc    1080
aagcacttcc cctccgaaga ctctgacctg gctggagaag ctgggccacg gagccagagg    1140
agaacagtgt ggccatgcta tgatgatgtc agctgtactc agcctgatgc tctcaccagc    1200
cttttcagtg aaattgaaaa attggagcac aaattgaacc aagcccctga gaagtggcag    1260
cagctgtggg aaagggtaac cgtggacctt aaagaagaac caagaacaga tcgctcccaa    1320
agacacctgt cgagatcccc aggaattgtg tctaccaacc taccttccta tcagaagagg    1380
tctctgctac atctcccaga cagcagcatg ggggaggaac agaattccag catctcccca    1440
tccaatggag tggagcgaag agcagccacg ctctatagcc agtatacatc caagaatgat    1500
gaaaacaggt cctttgaggg aacactttat aaaagagggg ctttgctgaa aggttggaag    1560
ccccgttggt ttgttttgga tgtaacaaaa catcagctgc gctactatga ctcaggtgag    1620
gacacaagct gtaaaggcca cattgatctg ctgaagtag aaatggtcat ccctgctggc     1680
cccagcatgg gagccccaaa gcacacaagt gacaaggctt tctttgatct caagaccagc    1740
aaacgtgtgt ataacttctg cgcccaggat ggacagagtg cccagcaatg gatggacaag    1800
atccagagtt gtatctctga tgcctgatgc ccatggtcaa cccacgcaga agaaacagaa    1860
gaactcatgc tgccagatag atagaacaag aagcatggat ccttgagg               1908
```


```
<210> 433
<211> 1714
<212> DNA
<213> Homo sapiens
```


```
<400> 433
tttttttttt ttgacaagtt tgcaagtttt attgaattaa tggctggctt tcacagatgt      60
taatcactgg cgggcggttg aataggggga acaggaaaat gctctccaga ggttcccact     120
gaagcccttt catctgccct gccccaaccc accactgaag ccagaggtca tgggagttgg     180
gatctaacta cactctgtga acttaccacc acccattcca tccccaagcc catattttat     240
ttgggactag gccactgatg cccgggccct tcctcttcca gtagggtggg agggtgggag     300
gtggggacac ggaccaaccc tcaaggaaag aaaagaggtt aaggtggggg gttttgctga     360
atgtctaaga aatgtcagtg gaacagggct ggggcacggt ggctcacgcc tgtaatccca     420
gcactttggg aggccaaggc aggtggatca cctgaggtca ggagttcgag accagcctgg     480
ctaacatggt gaaaccccat ctctactaaa aatacaaaaa ttagccaggc gtggtggcag     540
gtacctgtaa tcccagctac ttgggaggct gagacacagt ctcgctctgt ggcccaggct     600
ggatggagtg cagtggtgca atctcggctc actgcaacct ccgcctcccg ggtttaagca     660
```

221

```
aaattatcct gcctcagcct cctgagtagc tggattacag gcaggcacca ccacgtccgg      720
ctaatttttg tatttttagt agagatgggg ttttgccatg ttagccaggc tggtctcgaa      780
ctcctgacct caggtgatcc gcctgccttg gcctcccaaa gtgctgggat tacaggcgag      840
agccaccacg cccagcctct gcttcgtgag ttttctttcc cctgaggcac cctctgagtt      900
ctccacgtgt cagacccatg tccaatgcac cacgctcctt ccttcacacc atgaaagccc      960
cgaagtaaga ccgggtacca tcacgcagtc gaaccaggcg ttcatccagc acacggacga     1020
ccacctcctc cccagcctcc aggtgtacca caccacccag gaagctgctg tcccaccaga     1080
cccgggagct gctggtggcc cgtccgcagg gtgactgctg gctgaccaac agctccagct     1140
cctcggggta gcggggtgtg cgcttgtaga ggccgtgggt gatggtgctg gccaggccca     1200
gcgggcagcc cacaccgccc agctgcacct tggagtagat gtagtagtag ccagctttgg     1260
tgaccacaag ggccccatcg tggtagctga ggccctcag gaaggccagg cccagctgag      1320
tctcccataa cagcggcccc ccgctgccgg tcaagctgga gttggcccct gtgagatgcg     1380
ctgctgggtt gacctcgtga gaccttcgct cttgtatcag ctgctcccag gagcctgcag     1440
gtccgtcagg caggcgggtg accatctctc ctagacgcca gtgcagctgc aggaggaacc     1500
agccttggac ggccagccca gcccccatca gcaacagcaa gagacccaga cccacccggg     1560
ccacactgca cgactgtctc cggtggcttc gtcccagcct cgtgaatggg atgtcggtct     1620
gtccatccac cacaaacact gagggccgta cgacactctc ctccatgccc aaggtctctg     1680
gagcagggct gacacgcctg ggtccttcaa cctc                                 1714
```

```
        <210> 434
        <211> 478
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 434
tttcgtcaga gatagcagag cgccgagttg gggccacgaa ggcgtgaggg gagtcgtcgt       60
ccctcctgca cgaaagcgtc taagccttgg cgacgccgcc ctgggggacc cacgtcaggc      120
ctgggatagg gaccgctgtc cccgggtccc taccaatgtc gcccgtcgct cccggcccag      180
ctctacccgc agagtctgat ggcagcggcc actctgagga cgccaactca ggtgagtgcg      240
gcgtcttccc gtcctcacac accttccccc acccacgttc taaagccatc agtgaggggc      300
gcctgctcga gtccccgctg cccagggtcg gggacactga ggcgttcgtg ggtggggccc      360
ttttttgac actgcgtgtg acgaggtgtg ggagagcgtg acaggcggag gaaccggcgc       420
gtgcaaaggt tgaggcgcga ctgagccagg agaattcgga aagctgtttt ctgcaggc       478
```

```
        <210> 435
        <211> 1893
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 435
cagcagcgcg caggtcctca ccatagctct ggtggccacc tctgtcccgc catgctgctc       60
accgacagtg gccagggccc acagcaccaa gaggcttggg ccacaaagta aagggtcgcg      120
gagcctcgcc ggccgccatg tggagctgca gctggttcaa cggcacaggg ctggtggagg      180
agctgcctgc ctgccaggac ctgcagctgg ggctgtcact gttgtcgctg ctgggcctgg      240
tggtgggcgt gccagtgggc ctgtgctaca cgccctgct ggtgctggcc aacctacaca      300
gcaaggccag catgaccatg ccggacgtgt actttgtcaa catggcagtg gcaggcctgg      360
tgctcagcgc cctggcccct gtgcacctgc tcggcccccc gagctccgg tgggcgctgt       420
ggagtgtggg cggcgaagtc cacgtggcac tgcagatccc cttcaatgtg tcctcactgg      480
```

```
tggccatgta ctccaccgcc ctgctgagcc tcgaccacta catcgagcgt gcactgccgc .   540
ggacctacat ggccagcgtg tacaacacgc ggcacgtgtg cggcttcgtg tggggtggcg      600   ,
cgctgctgac cagcttctcc tcgctgctct tctacatctg cagccatgtg tccacccgcg      660
cgctagagtg cgccaagatg cagaacgcag aagctgccga cgccacgctg gtgttcatcg      720
gctacgtggt gccagcactg gccaccctct acgcgctggt gctactctcc cgcgtccgca      780
gggaggacac gcccctggac cgggacacgg gccggctgga gccctcggca cacaggctgc      840
tggtggccac cgtgtgcacg cagtttgggc tctggacgcc acactatctg atcctgctgg      900
ggcacacggt catcatctcg cgagggaagc ccgtggatgc acactacctg gggctactgc      960
actttgtgaa ggatttctcc aaactcctgg ccttctccag cagctttgtg acaccacttc      1020
tctaccgcta catgaaccag agcttcccca gcaagctcca acggctgatg aaaaagctgc      1080
cctgcgggga ccggcactgc tccccggacc acatggggggt gcagcaggtg ctggcgtagg      1140
cggcccagcc ctcctgggga gacgtgactc tggtggacgc agagcactta gttaccctgg      1200
acgctcccca catccttcca gaaggagacg agctgctgga agagaagcag gaggggtgtt      1260
tttcttgaag tttccttttt cccacaaatg ccactcttgg gccaaggctg tggtccccgt      1320
ggctggcatc tggcttgagt ctccccgagg cctgtgcgtc tcccaaacac gcagctcaag      1380
gtccacatcc gcaaaagcct cctcgccttc agcctcctca gcattcagtt tgtcaatgaa      1440
gtgatgaaag cttagagcca gtatttatac tttgtggtta aaatacttga ttcccccttg      1500
tttgttttac aaaaacagat gtttcctaga aaaatgacaa atagtaaaat gaacaaaacc      1560
ctacgaaaga atggcaacag ccagggtggc cgggccctgc cagtgggcgg cgtgtgctag      1620
caaggcctgc cgggtgtgcc gcagtcacca cagggttctg agaacatttc acagaagtgc      1680
ctgagacgcg gagacatggc tggtgttaaa tggagctatt caatagcagt gacgcgctct      1740
cctcagccac caaatgtccc tgacaccctc cccagccccc acagataaca tcagctgagg      1800
ttttttttcag tatgaacctg tcctaaatca attcctcaaa gtgtgcacaa aactaaagaa      1860
tataaataaa ccaaagaaag gtgaaaaaaa aaa                                    1893
```


```
<210> 436
<211> 1968
<212> DNA
<213> Homo sapiens
```


```
<400> 436
ccttgcttgc aggaagccat gcagttagtt tctgcagtta gtcgtgtgag gctaggtggt       60
tgggcaggcc tcgggctgta ggtgttgggt gggaaaaaga cccaagggcc tgaaagggag      120
ggaaagggga gggtagcggg agggtagcag gtgagttcct agggctggaa ggtttaacag      180
cagcctggtg cagtgccctg tcatcaagac aaacccacgg tcctcctggg tgcctaccaa      240
gcttggtttg tacaaaagca aggtgggagt ctattttgt acatgagata catcacactt       300
acctgtgggc cagtattgtg aagtgagtct gagttgttta cactgatgcc ttccctgccc      360
accacaaatt gtgtacatag tcttcagatg ataccacccc tttccccagc tcccaaccaa      420
gagctggttc taggcctgtg ttatatgtca tatttagcgt ttttatatat gacctttgat      480
ttctgttgtt tgtattttag cacagtgtat gcaccttcat ttaaatacat ctgtgtgcat      540
acagatacgc atatatgtgt gtgcgtatgc atatatctct catctgtagt ttccaagagt      600
tcagctgaag cagatggagt cctgcagccc aggagacacc ctgcatccct gctaatagtg      660
tttgccacaa gtattagtga gtcttcctta ttaatatttt catttcagaa gactgaagca      720
aagctgatag tgttgctgt ttcttggca gctaagtgag ggtcttggga tgacttgctg       780
tgttcctcaa gctgcacttt ggggccatct ctgcagtatt agcccccttt ttgcttggtg      840
gtactctgtc tgtgcctgtg tgtgtgtgtg atagtcactc ttgcatggct tccatgtctg      900
gtttgtggca tttggggata aggtgctgaa gccagagcat ttgcagtttg tttgaggcct      960
cgttgccaat gatagatcac tcctgttgac ctggtatgtc tgcttgcttg ctgcttttcc      1020
ttgctttctc ttggaagagg aaaggactct ggtcaggccc aggctgagtg agatgagctg      1080
cagctggctc atggccttct tagagcagag agaggagtat gtcattttac taagttccta      1140
aacaaacatt tatgcaggca acactccttg cagatccaga aactgaggca aatagggtt       1200
atgacttgct caagaatatg tagctgctag ggggtaaatc aaggcatcac aatttctgtt      1260
cagcgggcag gaataggctg tgaattgcta gcactttttt tttttaagca attacttttt      1320
gacttgttcc tctgaaaggg caagaggcgt acacctttcc caaatgtaaa ctaaaatctg      1380
caggatgcca cccactgtat agttctgctt tcccagagag gaagaacttt agaaaccaa       1440
atgatcttaa ttgttattgc ccacccctgg cttttccgggg tagaaaattc acagtaggaa      1500
```

```
tgattgttaa gagagagtgc ttggaaccat gggttaacag gaaaggctac ctaacttcac    1560
atatctgcaa ccagagcagc caccaagcat tacttagcag caggaaaatg attgtatttg    1620
agttcctgtg tgtccaaaac tgaggcacca tgttctttga aaacatgcca cctcaaggct    1680
gggcgcggtg gctcacacct gtaatcccag cactttggga ggccgaggcg ggcggatcac    1740
cggaggtcgg gagtttgaga ccagcctgac caacatggag aaaccccatc tctactaaaa    1800
atacaaaatt agccgggcgt ggtggcatgc gcctataatc tcagctactt gggaggctga    1860
ggcaggagaa ttgcttgaac ccaggaggcg gaggttgcgg tgagttgaga tcgtgccatt    1920
gcactccggc ctgggcaaca acagcaaaac tccgtctcaa aaaaaaaa                  1968
```

```
        <210> 437
        <211> 422
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 437
tttttttttt ttgaggcaga gtctcactct gtcacccagg ctggagtgta gtggcgcaac     60
ctcagcctct ccaagtgctg ggattacagg catgagccac cactcccagc caatagtgaa    120
ttttctaaga gcatgtatcc ctatcagtaa gtaacaggga tacatgaaga tacttataaa    180
atacagaaaa actgcccagc aaatcagggc cctaaacagt tggtagattc cataaattca    240
actggctacc atgtatagcc ctcactgtaa ggtaggtggt taggtttcta gagagcatta    300
gtcttagaat tatgaagagc catattaacc caaatgattt ctaaatttag atatatattt    360
tccctgctac ataaaaactc tgggtaataa ctagaaatag acccacaatt tagagacaat    420
gt                                                                    422
```

```
        <210> 438
        <211> 1319
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 438
aggcagcacg cggaggagcg cggccgccgc aaccccaaga cggggttgac cctggagcgt     60
gtgggccctg aaagcagccc ttacctcctg cggcgccacc agcgccaggg ccaggagggc    120
gagcactacc acagctgcgt gcagctggcc ccgacgcgag gcctggagga gtctgccacg    180
gcccctgag cttgccggtg gccctcgggt gggcggggtg gcgccgcggc cactgaagca    240
ccgcgcatgg agtggaaagt gaaggtgcgc agcgacggaa cccgctacgt ggccaagcgg    300
cccgtgcgag atcggctgct gaaagcccgt gccctgaaga tccgggagga gcgcagcggt    360
atgacgaccg acgacgacgc ggtgagcgag atgaagatgg ccgctactg gagcaaggag    420
gagcggaagc agcacctgat ccgggcccgt gagcagcgga gcggcgcga gttcatgatg    480
cagagccggc tggagtgcct gcgggagcag cagaatggcg acagcaagcc cgagctcaac    540
atcattgccc tgagccaccg caaaaccatg aagaagcgga acaagaagat cctggacaac    600
tggatcacca tccaggagat gctggcccac ggcgcgcgct ccgccgatgg caagcgggtc    660
tacaaccctc ttctctcagt caccaccgtg tgagctgccc gggcgggtac acggcccagg    720
cccagggaac ccctggggc ccggccctc actctcctat agagattgtg tgtgtgtgtg    780
tgtgcgcgcg cgcgtgctcg ctgtgcgcac gcacacatct cgtctgggtg tgcgcacagg    840
gctttgttag cagagagaag cccctgagga gaagggacgc ttttcttcct tctgcccaag    900
taaagtgacc atgccagtgg ccagcactgg gggcacacct gtgatgggca cccccttcagc    960
tgtgcgtgtg cattccccat ccccatgct cttgcgtgtg cttgcacgtg cacgcacaca   1020
cacacccagt gctctctcca cccgacccgt gtacttgcag acaggaagc tgagctgaaa   1080
```

```
ggagcacaag agagtgtccg gcttcgctgc tgagcgcggc ctctccccgc cgctgcgcac   1140
tgcagttatt tgtagacaaa ggcacccctg atttttgtgg tttttctccc tttctgtgct   1200
tgccaatagt tgtttttgttt tgtggacctg ccctgggggc tggcagctcc ttcaggcagc   1260
ctggcagaag tggaactccc ctctccactg atggctggga agggagttgg ggaggaaga   1319
```

```
        <210> 439
        <211> 1689
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 439
gagcgatcga ggctgcagcg cggccgccgg gcgcaacatg actgccgtcg gcgtgcaggc   60
ccagaggcct ttgggccaaa ggcagccccg ccggtccttc tttgaatcct tcatccggac   120
cctcatcatc acgtgtgtgg ccctggctgt ggtcctgtcc tcggtctcca tttgtgatgg   180
gcactggctc ctggctgagg accgcctctt cgggctctgg cacttctgca ccaccaccaa   240
ccagagtgtg ccgatctgct tcagagacct gggccaggcc catgtgcccg ggctggccgt   300
gggcatgggc ctggtacgca gcgtgggcgc cttggccgtg gtggccgcca tttttggcct   360
ggagttcctc atggtgtccc agttgtgcga ggacaaacac tcacagtgca agtgggtcat   420
gggttccatc ctcctcctgg tgtctttcgt cctctcctcc ggcgggctcc tgggtttttgt   480
gatcctcctc aggaaccaag tcacactcat cggcttcacc ctaatgtttt ggtgcgaatt   540
cactgcctcc ttcctcctct tcctgaacgc catcagcggc cttcacatca acagcatcac   600
ccatccctgg gaatgaccgt ggaaatttta ggcccctcc agggacatca gattccacaa   660
gaaaatatgg tcaaaatggg acttttccag catgtggcct ctggtggggc tgggttggac   720
aagggccttg aaacggctgc ctgtttgccg ataacttgtg ggtggtcagc cagaaatggc   780
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ttcttgaatt ttcttccctg gactggaata cagttggaag cacaggggta actggtacct   960
gagctagctg cacagccaag gatagttcat gcctgtttca ttgacacgtg ctgggatagg   1020
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gtccaatcag tgcctattct tccaccagct caaagggcct tcgtatgtat gtccctggct   1140
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gtaggtttcc aaaccatttg actcggtttg cctccctgcc cgttgtttaa accttacaaa   1260
ccctggataa ccccatcttc tagcagctgg ctgtcccctc tgggagctct gcctatcaga   1320
accctacctt aaggtgggtt tccttccgag aagagttctt gagcaagctc tcccaggagg   1380
gcccacctga ctgctaatac acagccctcc ccaaggcccg tgtgtgcatg tgtctgtctt   1440
ttgtgagggt tagacagcct cagggcacca tttttaatcc cagaacacat ttcaaagagc   1500
acgtatctag acctgctgga ctctgcaggg ggtgaggggg aacagcgaga gcttgggtaa   1560
tgattaacac ccatgctggg gatgcatgga ggtgaagggg gccaggaacc agtggagatt   1620
tccatccttg ccagcacgtc tgtacttctg ttcattaaag tgctcccttt ctagtcctta   1680
aaaaaaaaa                                                           1689
```

```
        <210> 440
        <211> 1574
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 440
ccagatcctg cccaacctct atctgggcag tgcccgggat ccgccaatt tggagagcct   60
```

225

```
ggccaaactg ggcatccgct acatcctcaa tgtcaccccc aacctcccaa acttcttcga    120
gaagaatggt gactttcact acaagcagat ccccatctcc gaccactgga gccagaacct    180
gtcgcggttc tttccggagg ccattgagtt cattgatgag gccttgtccc agaactgcgg    240
ggtgctcgtc cactgcttgg cggggggtcag ccgttctgtc accgtcactg tggcctacct    300
catgcagaag ctccacctct ctctcaacga tgcctatgac ctggtcaaga ggaagaagtc    360
taacatctcc cccaacttca acttcatggg gcagttgctg gactttgagc gcagcttgcg    420
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cccgccctcc ttcttcacca cccccaccag tgatggcgcc ttcgagctgg cccccaccta    540
gggccccgtg gccggcaggc cggcccctgc cccacccca cccacgggtg tccctgccca    600
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cccagtggct gcttggggga gaggcgtttg ccatcactgg tgttgtcacc tccctgtttc    960
tccaccaagg gcttgggcct ctcggggctg gggcctccca ggggatgggg acccagaggt    1020
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ggtgggctgt tttgtttttt ttttttcctc ttcccccaaa tgtcttgacg ggatcactgg    1140
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agctgcggag ggggagggga aaaaaaaggc ctcacttttg ctgcctgcgg ggccccacac    1260
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acgtgtcggc gctcacacac acatgctagc ccactgatgc acccagccca gggctggcag    1440
tctttgcagc gtggggccgt ctcaccctgg agcctggaga ggatctatgc ttgtttgttt    1500
ttgtaatcca tatcatagtt gctttctttа attgttcctt ctgaataaac agtttattta    1560
agataaaaaa aaaa                                                      1574
```

<210> 441
<211> 1102
<212> DNA
<213> Homo sapiens

.<400> 441
```
ttttttttta aaaaaaatt aagctctta attatgtgca cacagatttt agaaaaggta    60
gccttttgta tatagatacc tttacattct ttaggctgac ttttaaattg tcatcttttt    120
tcaactacag tttttgtata tagtaaacca gaagatgtgt atggaccctg ttatggccaa    180
gcatctcaaa gatgaagaga gaattaatga tagttatatt tcactcaaaa tgccaaaaaa    240
aaaaattcaa caaagtaaaa attttaaaac ttgactctaa ctagttcctt tttgttttac    300
attctcaaac cattgtcaaa tattctaaat atctctgaga atttctcttt taatgcttca    360
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tgtcaagttt tactgagtca ccaacttcac ctcttttgat ctgcctgttc tccaagaaca    540
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gtatatcttt tagtcttttt tgaagccttg tatagtcttc aaaggaaca ttttgtctat    840
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cttgtagtct tttcaatttg ttttcatgaa gagattttct ctaaaaagag aaatatgaac    960
aagtatgtta atacataatc tcttatttga acaaaactat atagaaaata ttttactcac    1020
caaaaactgt gtttagatat gaatgttttc agtgaatact agaaacaaag gttagtagac    1080
atggctctta ctgaaaattg ca                                           1102
```

```
        <210> 442
        <211> 1049
        <212> DNA
        <213> Homo sapiens



        <400> 442
ggaaggcctg gtgcaggagc ctctgagctc tttccttctg tgaccacgga cctgtcagtt      60
tccaaacaaa acgcgtgcct cacttgtgtg gattttgtca ctgtgcatgt atgtatgggt     120
ttctggggca ttggtcctgg tgctctctcc acatcctgca tcccgtaccc tctgtctcat     180
ggcccaggca gtgtgaaggc ggagatgctg cacatgtaca gccagaagga cccgctcatc     240
ctctgtgtgc gcctggccgt gctgctcgcg gtgaccctca ctgtgccagt cgtgctgttc     300
cctatccgcc gggccctgca gcagctgctt ttcccaggca aggccttcag ctggccacga     360
catgtggcca tagctctgat cctgcttgtt ttggtcaatg tccttgtcat ctgtgtgcca     420
accatccggg atatctttgg agttatcggg tccacctcag cccccagcct catcttcatc     480
ctccccagca tcttctacct ccgcattgta ccctctgagg tggagccttt cttatcctgg     540
cccaagatcc aggccctgtg ctttggagtc ctgggagtcc tcttcatggc cgtcagtcta     600
ggctttatgt ttgccaactg ggccacaggc cagagccgca tgtctggaca ctgatcaggc     660
cctgctggcc caggtccctg tgcgcatgca catggagggg tcagggccgc tccctagggt     720
ccctcctgcc caacatgtgg aggtggctgg ttcccatgaa cgtggttgtc agaggcgggg     780
gacagcagag gctgcagact ggcccacttc cctcctcccc agggatgcca agcttggatc     840
atggccctaa tcccaacccc aaccccatgg gaggaggagg aggaggaaga agaggaggag     900
gaggaggagg aggaggagga ggaggaggag gccaggtcct ggtggagcct ttgcccagcc     960
cagtcctctc tgcctcctcc tggctgaagc tgtttgtcca ggattaccct cggggctaaa    1020
gaggaaaaat aaagatgttg agctaccaa                                      1049
```

```
        <210> 443
        <211> 458
        <212> DNA
        <213> Homo sapiens
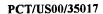


        <400> 443
gaattcatga cttaacgtca gttagtattg cttaatggaa tcgacataca tattgttata      60
ccgtgaatca ttttcagtca agaccacatt tctcagagtt tgccaaaaca aaccttctgc     120
cttcgggttg tcaggccact ggaggatgga gctcttacag atccgctgcc gtagcctcaa     180
atactgagaa tgctgtaaca ctggctccag caggataaat ataatcacat ccatgttctc     240
atccattagc ctctgcaaag ccaagtaaaa agctgtttta aagttccagc tttttgcata     300
ttttttggtt aaaacaaata ctgttttctt gctttggttg atgctctgca tgaggttgtc     360
gatgatggcc aatcccgggt cccaatccct ctcctctaga caaaggagaa cgttttttgtc     420
tcggctctct tcaaggtggt agcgcagctc atttatca                             458
```

```
        <210> 444
        <211> 1681
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 444
        tttttttttt ttgggctaga ggtttgggct ttaatggcag ctggggtaaa aggaaacaaa    60
        aacagtaatt ctgaagagca cagggaacag gcagccagga ccagcctggc ccattccagg   120
        ccagctgagc tgaaatgctg attctgtcca gggggctgct gtatgtgtag actggtggca   180
        gtcttgggga ctgaggcctc ttggagagaa gggaagactg tcggctcaga agtccatgga   240
        gctgtgggcc aggtagtcct tgcgaccgat gttgctgacc tgcttggtct gcatagcctc   300
        gagtttgggg cagtcagtga tccgatgacc caggcccccg cagaaggcac agccgcgctc   360
        tcctccaatg tccagcatgg actcatcccc gcaatgcagc acctgcagca cgggcggcac   420
        cttctgcttg gcttctagca gcagcgcttt gaggtccatc agcactgact catcacacgc   480
        tttgttgatg aaggtagtgg cgatgcctgt gtttcccgag cgcccggtgc ggccaatccg   540
        gtgtacatag ttctcaatct cctctggcat gtcataattg atgacgtgct ggatggcagg   600
        gaagtccagg cccttggagg caacgtctgt ggctactagg acatccttct tgccctcccg   660
        gaatgcctcg atggccttag tccgttcctc ctggtctttg cccccatgga tggctacggc   720
        ctcaaccccc ttgagcagca ggtactcgtg gatggcgtcc acgtctgcct tcttctctgc   780
        aaagatgagt acaggcgggg gtgtcttctg caggcactcg agcaggtaca ccatcttggc   840
        ctcctccttc acatattcta cctcctggat gacatccagg ctggcagccc cagcgcgccc   900
        cacattgatg gtcacaggct ttacaagggc actcttagca aagttctgaa tcttcttcgg   960
        catggtggca ctgaagagca gggtctgtcg ctggcccttg aagtaggaga agatggtacg  1020
        gatgtcaccc tcgaagccca tgtcgatcat gcggtcagcc tcgtccaggg ccaggtagcg  1080
        acagatgtct aggctgacca tcttcttctg cagcaaatcc atgaggcgcc ccggggtggc  1140
        caccatcatg tgtacaccgt gtcggatggt ctccatctgc tctttcacgg acatgccccc  1200
        aatgcagagg gcgcagcgca ggagtggtga gctgtcctcc tgcagcaggc ggcagtagta  1260
        ctccaggatg ccatgggtct gccgggccag ctcccgcgag gggcagatga tgagtccata  1320
        gggcccctcg cgctttgaga agggtaacct cttctcttgt tccaggcaga acatgatgac  1380
        gggcaacgtg aacaccagtg tcttgcctga acccgtgaaa gcgatgccta tcatgtcacg  1440
        gccagataga atggtgggga tgccctggat ctgaatgggt gttgggtggt gaatgccttt  1500
        cttcttcagg cctctcagga tggctgcagg aaacttcatt tccttgaagc tcttgatggg  1560
        tggtgggata ccgtctccct ccaccaggat gtggtatttc ttccgcacgc gctcatgtcg  1620
        ctcttcagac atgctcagaa cataacgggg tggagtccag ctggttttga tggggtcatc  1680
        a                                                                 1681
```

```
        <210> 445
        <211> 621
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 445
        atcgagacca cccagcccag tgaggacacg aatgccaaca gtcaggacaa cagcatgcaa    60
        cctgagacaa gcagccagca gcagctcctg agcccacgc tgtcggatcg aggaggaagt   120
        cggcaagatg cagccgacgc agggaaaccc cagaggaaat ttgggcagtg gcgtctgccc   180
        tcagccccaa aaccaataag ccattcagtg tcctcagtca acttacggtt tggaggaagg   240
        acaaccatga aatctgtcgt gtgcaaaatg aaccccatga ctgacgcggc ttcctgcggt   300
        tctgaagtta agaagtggtg gacccggcag ctgactgtgg agagcgacga aagtggggat   360
        gaccttctgg atatttaggt ggatgtcaat gtagatgaat ttctagtggt ggaaaccgtt   420
        ttctaataat gtccttgatt gtccagtgag caatctgtaa ttgatctata actgaattcc   480
        agcttgtcac aagatgttta taaattgatt ttcatcctgc cacagaaagg cataagctgc   540
        atgtatgatg ggttactatc aatcattgct caaaaaaatt tttgtataat gacagtactg   600
        ataatattag aaatgatacc g                                            621
```

```
        <210> 446
```

```
       <211> 468
       <212> DNA
       <213> Homo sapiens




       <400> 446
taacgatcgc ttctctgctt gctacttcac cttgaaactc aaggaagcag ctgttagaca      60
gcgtgaagcc ctaaagaagc ttaccaagaa tatagccact gactcatata tcagtgttaa     120
cttgagagat gtctatgccc ggagtatcat ggagatgctg cgactgaaag gcagagaaag     180
agcaagtact aggagcagcg ggggagatga tttctggttt tgaattaatt ttcaatttat     240
ttacaaaagc tatgtacaat taactaaaat gataaagcag tgatgtggat ttctgtattc     300
tgatgatgag tctcttcaga gtactgctca tcttaattaa ttttttgctga tatattgctt     360
catctactag aatatttcac atcacctata acaactgcac agtgttctga cacatttgag     420
tgtccaaaat agccaattaa cacaaccaaa tacaactggg catgtatt                  468




       <210> 447
       <211> 1030
       <212> DNA
       <213> Homo sapiens




       <400> 447
ctttactgtc ttcattctgg gaataactat tcgaccactg gtggagtttc ttgatgtcaa      60
gaggtccaat aagaaacaac aagctgtcag tgaagaaatc tattgtcggt tgtttgatca     120
tgtgaagact ggaattgaag atgtttgtgg acattggggt cacaactttt ggagagacaa     180
gtttaagaag tttgatgata aatatctgcg gaagcttttg attcgggaaa accaaccaaa     240
gtcaagtatt gtatctttat ataaaaagct tgaaataaaa catgccattg agatggcaga     300
gactgggatg ataagtactg tccctacatt tgcatctcta aatgattgtc gtgaagaaaa     360
aataaggaag gtcacgtcca gtgaaactga tgaaattcga gaactcttat caagaaatct     420
ctatcaaatc cgtcagcgaa ctttatccta caacagacac agtctgacag ccgacacaag     480
tgagagacaa gccaaggaga ttctgattcg ccggcgacac agtttgcgag aaagcattag     540
gaaggacagc agcttgaatc gagaacacag ggcttccact tcaacctccc gatatttatc     600
cttacctaaa aatacgaagc ttccagaaaa gctacaaaag aggaggacta tttctattgc     660
agatggcaat agcagcgact cagacgcaga tgccgggacc accgtgctca atttgcagcc     720
cagagccagg cgcttcttgc cagaacagtt ctccaagaaa tcccccccagt cctataaaat     780
ggaatggaag aatgaggtag atgttgattc tggccgagat atgcccagca ccccccaac     840
accccacagc agagaaaagg gcacccagac gtcaggctta ctacagcagc cccttctctc     900
taaagaccag tctggctcag agagggaaga cagtttgact gaaggcatcc cgcccaagcc     960
gccaccacgg ctggtctgga gggcatcgga acctggaagc cggaaagccc gatttgggag    1020
tgagaagcct                                                          1030




       <210> 448
       <211> 1936
       <212> DNA
       <213> Homo sapiens
```

```
        <400> 448
ggcacgagga ggcctcgggg ctgtccgtgt ggatggggaa gcagatggag cccttgcacg    60
cagtgccccc ggcagccatc accttgatct tgtccttgct cgttgccgtg ttcactgagt   120
gcacaagcaa cgtggccacc accaccttgt tcctgcccat ctttgcctcc atgtctcgct   180
ccatcggcct caatccgctg tacatcatgc tgccctgtac cctgagtgcc tcctttgcct   240
tcatgttgcc tgtggccacc cctccaaatg ccatcgtgtt cacctatggg cacctcaagg   300
ttgctgacat ggtgaaaaca ggagtcataa tgaacataat tggagtcttc tgtgtgtttt   360
tggctgtcaa cacctgggga cgggccatat ttgacttgga tcatttccct gactgggcta   420
atgtgacaca tattgagact taggaagagc cacaagacca cacacacagc ccttaccctc   480
ctcaggacta ccgaaccttc tggcacacct tgtacagagt tttggggttc acaccccaaa   540
atgacccaac gatgtccaca caccaccaaa acccagccaa tgggccacct cttcctccaa   600
gcccagatgc agagatggtc atgggcagct ggagggtagg ctcagaaatg aagggaaccc   660
ctcagtgggc tgctggaccc atctttccca agccttgcca ttatctctgt gagggaggcc   720
aggtagccga gggatcagga tgcaggctgc tgtacccgct ctgcctcaag catcccccac   780
acagggctct ggttttcact cgcttcgtcc tagatagttt aaatgggaat cagatcccct   840
ggttgagagc taagacaacc acctaccagt gcccatgtcc cttccagctc accttgagca   900
gcctcagatc atctctgtca ctctggaagg gacaccccag ccagggacgg aatgcctggt   960
cttgagcaac ctcccactgc tggagtgcga gtgggaatca gagcctcctg aagcctctgg  1020
gaactcctcc tgtggccacc accaaaggat gaggaatctg agttgccaac ttcaggacga  1080
cacctggctt gccacccaca gtgcaccaca ggccaaccta cgcccttcat cacttggttc  1140
tgttttaatc gactggcccc ctgtcccacc tctccagtga gcctccttca actccttggt  1200
cccctgttgt ctgggtcaac atttgccgag acgccttggc tggcaccctc tggggtcccc  1260
cttttctccc aggcaggtca tcttttctgg gagatgcttc ccctgccatc cccaaatagc  1320
taggatcaca ctccaagtat gggcagtgat ggcgctctgg ggaccacagt gggctatcta  1380
ggtcctccct cacctgaggc ccagagtgga cacagctgtt aatttccact ggctatgcca  1440
cttcagagtc tttcatgcca gcgtttgagc tcctctgggt aaaatcttcc ctttgttgac  1500
tggccttcac agccatggct ggtgacaaca gaggatcgtt gagattgagc agcgcttggt  1560
gatctctcag caaacaaccc ctgcccgtgg gccaatctac ttgaagttac tcggacaaag  1620
accccaaagt ggggcaacaa ctccagagag gctgtgggaa tcttcagaac ccccctgtaa  1680
gagacagaca tgagagacaa gcatcttctt tccccgcaa gtccattta tttccttctt  1740
gtgctgctct ggaagacagg cagtagcaaa gagatgagct cctggatggc attttccagg  1800
gcaggagaaa gtatgagagc ctcaggaaac cccatcaagg accgagtatg tgtctggttc  1860
cttgggtggg acgattcctg accacactgt ccagctcttg ctctcattaa atgctctgtc  1920
tcccgcggaa agctcc                                                  1936
```

```
        <210> 449
        <211> 354
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 449
ggcacgagct ggaaaacaat tggcttcaac atgagaaagc tcctacagaa gaagggaaaa    60
aagagctgct ggccctaagt aacgcgaacc cctcgctgct ggagcggcac tgtgcctacc   120
tctaagccaa gatcactgaa tgagcggacg actgaggaca tatgctttaa gctcgaccca   180
ttcccatagc gacgctcatc actctgcttg catgctcttc aaccctcagc tgtcggctct   240
cgagctaccc cctcaatgtc atgcggcctc cttcccatcc gcccttcctc gccgctgctc   300
agtactccgc gttaggagac cttcgtactt agcggcccgc tccagagtac cgcc          354
```

```
        <210> 450
        <211> 1073
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 450
ggaaacatca  tctacatgta  catgcagcca  ggagccaggt  cttcccagga  ccagggcaag    60
ttcctcacgc  tcttctacaa  cattgtcacc  cccctcctca  atcctctcat  ctacaccctc   120
agaaacagag  aggtgaaggg  ggcactggga  aggttgcttc  tggggaagag  agagctagga   180
aaggagtaaa  ggcatctcca  cctgacttca  cctccatcca  gggccactgg  cagcatctgg   240
aacggctgaa  ttccagctga  tattagccca  cgactcccaa  cttgcctttt  tctggacttt   300
tgtgaggctg  tttcagttct  gacattatgt  gttttgttg  ttgctcttaa  aattgagacg   360
gggtctcact  ctgtcaccta  gggtggagtg  cagtggtgcc  accatagctc  cttcgactat   420
tgggcttaag  cgatcctccc  ccacctcagc  cttccaagta  actgggacta  caggtgtgca   480
tcactggcag  tgggaattgt  ggctttctg  tcttctatgg  agacggggtc  ttgcctgtgt   540
tgccccaggc  tggtcccaaa  cccctggcc  tcatgtgatc  ctcctgccat  ggcctcctaa   600
agttctggga  ttacaagtgt  gagtcactgt  gactggccaa  cattatgtga  tttatgtgtg   660
aacctatata  acacaaatca  tcccccaaaa  ccccatcctg  gatctgtaaa  gcagctgcca   720
aagaatgaag  tgagagaaac  agttgtaaag  atgagtttcc  caccctactt  atacccagag   780
tgcctaagag  gaaatcaact  cttcctcaat  cagagctttg  cctttgtttg  ttgttgtttg   840
cctttaaagt  ctaacacacc  tgacatgttt  cagtcagaat  gaccccaaat  gcatcactgt   900
tctccacgtg  gtcccaagtg  cctctctgtt  tagggccatc  aaatcatgga  atgcagcaca   960
gtttgatatt  ttctatattc  ccaattccta  cccaaacctt  ttcatgaaat  cgtagagttt  1020
gttttaccct  ttatctggtg  taagattctg  cataaaccaa  gaagtgaacc  tgt          1073


        <210> 451
        <211> 2674
        <212> DNA
        <213> Homo sapiens


        <400> 451
gcgcattgac  ccctagaaca  gcgctcgaat  tgccgcgtcg  acccacgcgt  gcgaacccac    60
acaatggcca  gcgataccag  cagcctggtg  cagtcccata  cttacaagaa  gcgagagccg   120
gccgacgtgc  cctatcagac  tgggcagctc  caccccgcca  tccgggtggc  agacctcctt   180
cagcacatca  cacagatgaa  gtgtgcggag  ggctacggct  tcaaggagga  atacgagagc   240
ttctttgaag  ggcagtctgc  accatgggac  tcggctaaga  aagatgagaa  cagaatgaag   300
aacagatacg  ggaatatcat  tgcatacgat  cattcccgag  tgaggctgca  gacaatagaa   360
ggagacacaa  actcagacta  tatcaatggc  aattatatcg  atggttatca  tcgacccaat   420
cattacattg  ctacccaagg  gccaatgcag  gaaaccatct  atgacttctg  gaggatggtg   480
tggcacgaaa  cacctgcaag  tatcatcatg  gtgaccaatc  ttgtggaagt  gggaagggtc   540
aaatgctgca  aatactggcc  agatgacaca  gagatatata  aagacattaa  agttacccta   600
atagaaacag  aactactggc  agaatatgtg  ataagaacat  ttgctgttga  aaagagaggt   660
gtgcatgaaa  tccgagagat  cagacagttt  cacttcactg  gctggccgga  tcatggggtc   720
ccctaccatg  ccaccggcct  gctgggattc  gtgcggcaag  tcaagtccaa  gagcccgccc   780
agtgcaggcc  cactggtggt  gcactgcagt  gctggtgcag  ggaggactgg  ctgtttcatc   840
gtcattgata  tcatgttgga  catggccgaa  agggaagggg  tcgtagacat  ctacaactgc   900
gtcaggggagc  tgcggtcacg  gagggtgaac  atggtgcaaa  cagaggagca  gtatgtgttt   960
atccacgatg  cgatcctgga  agcctgtctt  tgtggggaca  cctctgtgcc  tgcttcccaa  1020
gttaggtctc  tgtattatga  catgaacaaa  ctggatccac  agacaaactc  aagccagatt  1080
aaagaggaat  tccggacgtc  aaacatggtg  acaccaacgc  tgcgagtaga  ggactggcagc  1140
atcgcactgt  tgccccggaa  ccatgagaaa  aaccggtgca  tggacatcct  gccccccagac  1200
cgctgcctgc  ccttcctcat  caccatcgat  ggggagagca  gcaactacat  caatgctgcc  1260
ctcatggaca  gctataaaca  gccttcagct  tttatagtca  cccagcatcc  tttgccaaac  1320
acagtgaaag  acttttggag  actggtcctg  gattatcact  gcacatccgt  agttatgcta  1380
aatgatgtgg  atcctgccca  gttgtgtcca  cagtactggc  cagaaaacgg  agtacacaga  1440
cacggcccca  tccaggtgga  atttgtctct  gctgacctgg  aagaggacat  catcagcagg  1500
```

```
atattccgca tttacaatgc cgccagaccc caagatggat atcggatggt gcagcaattc    1560
cagttcctgg gctggccgat gtacagggac acaccagtgt ctaagcgctc cttcttgaag    1620
ctcattcgcc aggtggacaa gtggcaagag gaatacaatg gcggggaagg ccgcaccgtt  · 1680
gtgcactgct tgaacggggg aggccgcagt gggacgttct gcgccatcag catcgtatgt    1740
gagatgctcc ggcaccagag aaccgtggat gtctttcacg ctgtgaagac actgaggaac    1800
aacaagccca acatggtcga cctcctggat cagtacaagt tctgctacga ggtggccctg    1860
gaatacttga attctggctg atggtgtaaa cagctctgca aacaatccct ttcataccac    1920
aaagccaaga cgttccatgg tatttgtgca aaagagatga agacttctca atatgcttat    1980
tttgctttgc ataattggct ctttttaaga gcccaagaaa gtgtttctaa aattgcttgc    2040
actgcccaat cccagtaatg ctgctgcctg acagaaacac acacacagcc acagttgcca    2100
aatcccgtac tccttgccac cggcttccta gagcagcgta gacagctggt aaactgaaga    2160
gcacaactat attcttatga aggaatttgt acctttgggg tattattttg tggcccgtga    2220
ccctcgttat tgttacagct gagtgtatgt ttttgttctg tggagaatgc tatctggcat    2280
tatggtaata tattatttta ggtaatattt gtactttaac atgttgcata atatatgctt    2340
atgtagcttt ccaggactaa cagataaatg tgtaatgaac aaagatatgt tgtatgagtc    2400
gtcgtttctg tcagatttgt attgtttcca agggaaaagc ttgggggagg actcagttca    2460
caaaatgcaa aactcaacga tcagattcac ggacccagag cttttccatg tgtttatatt    2520
gtaaatattt ttgatttcat cgaaattatt tattcattaa aagaaatttt tgtgaagcac    2580
agtgagtgac aatcattttt cttaaggcct ggaaacgatt ttctgtatga tgttacttta    2640
tgtgaattct catctcaata aatgatgacc cgtg·                                2674
```

```
        <210> 452
        <211> 601
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 452
tttttttttt tttcagcggg aaaaatgtgg atttaatgga atgaaggatg aaagggcccg      60
aagccagcaa gtctcgcccc acctaccagc ccccacccag cttcccaagg gtctcagagg     120
gacactcttg gcactggcct ttcacatctg ttcaacaacc cctgagctga aaagttgcag     180
tgggaggcct ccagctcagc aggtggactc caaaataccc ctcttgtctt atccactcca     240
ggtcgggggc agggaagcac atggggctgc ttctgccacg ttccctccac agccatcccc     300
aaggccaggc acacaggcac catccaaggg cctgcccect agcagtgaga ctctagctct     360
gtgagtctga gcagtgaggt cctgggggtg gcgggagccg agggtcctgc tgggttccgc     420
tggggcaggt cctcggctgg gcacatgagc tgacggattc tctctctgaa ggggcccttg     480
agggttccga gtctgtagag gctccaggca ggaatgcaga ccatggagga cagagccagg     540
agccagccca gggcatcgcc ccaccacggg tacgtgtact tcttgttgta ggtcagcgga     600
g                                                                     601
```

```
        <210> 453
        <211> 474
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 453
cgacccacgc gtgcgggatc ctatcgaaaa ggattggtgc gactgggcca tgattagcag      60
gtaggggcag tgatggaggg tggctcaggc caggggtgg acctgctcat tgcaggtaga      120
ccctgagtga gagtggggca ctcttctccc tgggtccacc ccctctctca ctcaagtcct     180
```

```
cttctgcccc taggccttat agcaccctgc gagattgcct ggagcacttt gcagagttgt    240
ttgacctggg cttccccaat cccttggcag agaggatcat ctttgagact caccagatcc    300
actttgccaa ctgctccctg gggcagccca ccttctctga cccccccagag gatgtactcc    360
tggccatgat catagccccc atctgcctca tccccttcct catcactctt gtagtatgga    420
ggagtaaaga cagtgaggcc caggcctaag gggccacgag cttctcacaa ccat           474
```

```
                <210> 454
                <211> 1838
                <212> DNA
                <213> Homo sapiens
```

```
                <400> 454
        tttttttttt ttatatttaa aaattaattt aatgcttggc taaatcttaa ttacatatat     60
        aattatcaaa cgatagtcct taattccaa aaaaattcct cttttgaaaa tccagaatca    120
        gaaagcataa actttaaac caagttcccc tgaatattta caatgtggta taaacattat    180
        agaagaccat ggatattaaa ttgcctgggg tgtggctaat cagcaaggcg tattctttat    240
        tgcatattta actcacatat gtgggatttt aaatatgaca gactactaaa attcaaatgc    300
        atgtatctgc aagctgggca gggagtaaaa tcatgaatga gacaggacgg tcagcccaaa    360
        accatgcaat taggttgtgg gtttattatt ttcaaaagtg aaatttctat gttccatttg    420
        aaactatgtt gcatattcat ttagcattca cattaaaccc acatttgact ctaacgctga    480
        ttcaaggaag aaagttcaac attcactcaa tgactaagtc cacaactcaa ctctcaatgt    540
        taaggcagca cagctacagt gatagcaacg ctaaccaaaa ggtaatgaac atttagtcac    600
        ttgccagccc ttttgttaca acagtgtagt aatttcccta agacaatttg ctaccggata    660
        attttctgct gttaaaaggc ttcctctgtg gaaaaacacc acaaatttcc agtgtgaaag    720
        taagtccatg gtggtataaa tatatatatg cataattaca caatttacac tgcacacatc    780
        gtttacaggg gacaattaac tgagagggtt aatttaaatg accatacaaa atacttcagt    840
        aaacaaagta tgacaggcag taaagaaaac attcatagac tcctagaaat aatctgaatt    900
        cctttcattc tgaagaaata tcatttaagg acacagtatt gaatataatg tttttttgtat    960
        taaaacaaga attgctattt tacagtttaa gaaactttac atatatacaa aatttacaca   1020
        ttgggaatgg taatcaagca aataggtttt tcagtctcat agatctattt tccttcgatc   1080
        aaagacttaa attctttcac attgtggtca cttgcaacag acatagcatg atccaaagct   1140
        cgaacacttg caaggagttt tactatctgt tttatgtttt cccttgcatt tcttttttcc   1200
        acatcagaac acccgatact atttctataa attgtatccg ctaagtgtac aaggtatcgg   1260
        caaaagtttt ctaactgaga aatagtcctt tctcctttca gattcatgaa ccattgtttg   1320
        gggaaacaat tgattacatt ttgggctttt ttgatgctgt catctccata ttctgaattc   1380
        tgaaaagcca tgagaatata tcgatttaat aaaccatcta ttgataactc ttgcagagtt   1440
        ttatttgaga aaatgccata ccactgaaga aaattgccta acagcttaac tgaagaccaa   1500
        aactgtcgtt gaaaaaacaa gtaaggccca gaatttttat tttctaagac atttttggga   1560
        tataagggca taaatacatc atcatctaaa gttcttctca ttctcaataa aagtgccttt   1620
        aggtatacct gtgtattttt attttctgca ttcactactg aaggatatcc attgattaat   1680
        tttagtgtaa ttcccaccat tcttgaagtc tgtgttgtag aaaaagggtc ccacatattt   1740
        tcagctatca ctgttagttt aggaagaatc accttttcca caatggtagg tagtagggca   1800
        acatctacat catctttttc ttgctctcgt tcttcaca                          1838
```

```
                <210> 455
                <211> 1790
                <212> DNA
                <213> Homo sapiens
```

```
      <400> 455
tgatccgatc ttgcactccg tcactgtggc tgactgcatt gtcacattca cttggcggag      60
gccaatttcc tacaggtgct ttcaggatca ggtcactgcg atggtctcta aacaccattc     120
tgctttctct gctctcttgt ctttaggagc cgggtgtggg ctgagccctg cctgattgat     180
gctgccaagg aggagtacaa cggggtgata gaagaatttt tggcaacagg agagaagctt     240
tttggacctt atgtttgggg aaggtatgac ttgctcttca tgccaccgtc ctttccattt     300
ggaggaatgg agaacccttg tctgaccttt gtcaccccct gcctgctagc tggggaccgc     360
tccttggcag atgtcatcat ccatgagatc tcccacagtt ggtttgggaa cctggtcacc     420
aacgccaact ggggtgaatt ctggctcaat gaaggtttca ccatgtacgc ccagaggagg     480
atctccacca tcctctttgg cgctgcgtac acctgcttgg aggctgcaac ggggcgggct     540
ctgctgcgtc aacacatgga catcactgga gaggaaaacc cactcaacaa gctccgcgtg     600
aagattgaac caggcgttga cccggacgac acctataatg agacccccta cgagaaaggt     660
ttctgctttg tctcatacct ggcccacttg gtgggtgatc aggatcagtt tgacagtttt     720
ctcaaggcct atgtgcatga attcaaattc cgaagcatct tagccgatga ctttctggac     780
ttctacttgg aatatttccc tgagcttaag aaaaagagag tggatatcat tccaggtttt     840
gagtttgatc gatggctgaa taccccggc tggccccgt acctccctga tctctcccct     900
ggggactcac tcatgaagcc tgctgaagag ctagcccaac tgtgggcagc cgaggagctg     960
gacatgaagg ccattgaagc cgtggccatc tctccctgga agacctacca gctggtctac    1020
ttcctggata agatcctcca gaaatcccct ctccctcctg ggaatgtgaa aaaacttgga    1080
gacacatacc caagtatctc aaatgcccgg aatgcagagc tccggctgcg atggggccaa    1140
atcgtcctta agaacgacca ccaggaagat ttctggaaag tgaaggagtt cctgcataac    1200
caggggaagc agaagtatac acttccgctg taccacgcaa tgatgggtgg cagtgaggtg    1260
gcccagaccc tcgccaagga gacttttgca tccaccgcct cccagctcca cagcaatgtt    1320
gtcaactatg tccagcagat cgtggcaccc aagggcagtt agaggctcgt gtgcatggcc    1380
cctgcctctt caggctctcc aggctttcag aataattgtt tgttcccaaa ttcctgttcc    1440
ctgatcaact tcctggagtt tatatcccct caggataatc tattctctag cttaggtatc    1500
tgtgactctt gggcctctgc tctggtggga acttacttct ctatagccca ctgagccccg    1560
agacagagaa cctgcccaca gctctcccg ctacaggctg caggcactgc agggcagcgg    1620
gtattctcct ccccacctaa gtctctggga agaagtggag aggactgatg ctcttctttt    1680
ttctctttct gtccttttc ttgctgattt tatgcaaagg gctggcattc tgattgttct    1740
tttttcaggt ttaatcctta ttttaataaa gttttcaagc aaaaaaaaaa               1790
```

```
      <210> 456
      <211> 1293
      <212> DNA
      <213> Homo sapiens

      <220>
      <221> misc_feature
      <222> (1)...(1293)
      <223> n = a,t,c or g
```

```
      <400> 456
tgcgcaagcg ggagttccgg ctggagaccc gtgctctggg ccggcgcctt caccatggcc      60
tcggcagagc tggactacac catcgagatc ccggatcagc cctgctggag ccagaagaac     120
agccccagcc caggtgggaa ggaggcagaa actcggcagc ctgtggtgat tctcttgggc     180
tggggtggct gcaaggacaa gaaccttgcc aagtacagtg ccatctacca caaaaggggc     240
tgcatcgtaa tccgatacac agccccgtgg cacatggtct tcttctccga gtcactgggt     300
atcccttcac ttcgtgtttt ggcccagaag ctgctcgagc tgctctttga ttatgagatt     360
gagaaggagc ccctgctctt ccatgtcttc agcaacggtg gcgtcatgct gtaccgctac     420
gtgctggagc tcctgcagac ccgtcgcttc tgccgcctgc gtgtggtggg caccatcttt     480
gacagcgctc ctggtgacag caacctggta ggggctctgc gggccctggc agccatcctg     540
gagcgccggg ccgccatgct gcgcctgttg ctgctggtgg cctttgccct ggtggtcgtc     600
ctgttccacg tcctgcttgc tcccatcaca gccctcttcc acacccactc ctatgacagg     660
ctacaggacg cgggctctcg ctggcccgag ctctacctct actcgagggc tgácgaagta     720
```

```
gtcctggcca gagacataga acgcatggtg gaggcacgcc tggcacgccg ggtcctggcg      780
cgttctgtgg atttcgtgtc atctgcacac gtcagccacc tccgtgacta ccctacttac      840
tacacaagcc tctgtgtcga cttcatgcgc aaactgggtc cgctgctgaa ggccattgct      900
ccatctcacc tctgctccca gaaaataaat gccctgaaac cctcccccca naacctgcaa      960
tctgtcgggc actcttctcg ttcaactccc tgtagccctt tgggactttg cggtccccta     1020
agtagaaaat tcctatgggc ctgtctcctg ggggcctctg tctgctggtg gtctgcttac     1080
cacagaatcc taaggggcag gagtgcctgg gcatgtgtct gtgggagcct tgcagtcagt     1140
tgtgtttgga caagtgcaac agtcaggctg ctgattcctg tggcatgcag gctgtagagg     1200
ttgacaaatg gagggggggtg ttgagggtga gccctagttg attttttaaa atttaaactc     1260
tggtaagaac atttaatatg aaaaaaaaaa aaa                                   1293
```

```
        <210> 457
        <211> 1155
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 457
cccacgcgtc cgggacagac tcccatccac tggggtcagg gaccggaaag gcgacaaacc       60
ctggaaggag tcaggtggca gcgtggaggc ccccaggatg gggttcaccc acccgccggg      120
ccacctctct gggtgccaga gcagcctggc cagtggtgag acggggacag gctctgctga      180
cccgccaggg ggaccccgcc ccgggctgac ccgaagggcc ccggtaaaag acacacctgg      240
acgagccccc gctgctgacg cagctccagc aggcccctcc agctgcctgg gctgaggtgt      300
ctggtgcctg gaacagactt ccctgtggag gattcctgcc agaccctgcc cggctcctcc      360
ctgaccggtc cttgtgccct caccagacac cctgttggcc atgactcaac aaaccagtgt      420
tgggagccgt ctgcctcccc agctcagtgc ctttctgcac cccttctctc ctggggagct      480
gtctgcatcc gccacccct ccaaccactg ccctcagccc ccgaccttat ttattaccct      540
cccctcccac accccaatc tacctggtga tgatttttaag tttgcgcgtg tcttgggttg      600
ggctggggggg tttcccacat gcagtgtcag aggggccgcc cggtgggggct atctccgttg      660
ctatattaat ggcaagacta aatgaaacct agggcacggc ctccgaagct gcgtgtggcc      720
ccttagaggt gagcatcaga gccagagcag tgaggggggag actcacccac cctctccctc      780
tcccttcagc tctgggaggc aggcgcagtg ccccccctccc gtgggctggc ccaggaccgc      840
gggtgaaacc tgggtctgtt tagtttcttt ggttttttgta tgtttgtttg ttttttgacac      900
agtctcgctt tgttgcccag gctggggtgc agtggcacga tcgcggctca ctgcaacctc      960
cacctcccgg gctcaagcga ttctctcacc tcagcctcct gagtaggtgg gattacagat     1020
gcccgccacc acacccagtt aattttttgta ttttttagaag agatggggggtt tctccatgtt     1080
ggccaggctg gtcttgaact cctggtctca agtgatccgc ccgcctcggc ctcccaaagt     1140
gctgggatta caggg                                                        1155
```

```
        <210> 458
        <211> 1297
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 458
ggcaccaatc caatgtcagt atctgcaggc tgaagtacag acagttacac tgaaattgcg       60
tatgctctga ggaatgacac taaattcgct tccaggaaaa ttactcaatt ttgtaagtaa      120
ttttcagttt tttttctcag ggatattttt caactttcac tttaattttc tttagttgct      180
tagttgtaca ttttgagaag gcaaatccat tggaacttgg ggaggcttag aacataaatc      240
```

235

```
agtattagaa gtaaagggaa cacacagcta aaagttttac tttaatcaca aattcacaac    300
tagagatatc atttgcatat cttagaacgc taaagacctg ttaaaatttt ttaaccaatc    360
agcaaaaata tgtgccccac agatttctaa tgttcataat ttagaattta tcacatataa    420
tatttattaa tagtttatttt gcaaaattat tattcttaaa acacttcttt ccaacacatt    480
tacaatgttc atgtgtttta aagaaaaaaa ccaccctcat ttaaaaatgt actactgact    540
ttaatgtgtg gttataccag tgccaccaaa ttagaaaaga aaaagaaaca tacagctgta    600
ttggatatgt agttactact acaaataatg acaacacacg tcctatacaa agatcatatt    660
cacgctttc taccacttct cagtcattgt cagaaccatt tggaggtaag aaaaccaatg    720
catcattgaa aatatggccc aaatgcccta aggcggtata ccccatacat catcacatgc    780
atctgatttg gagtcagtcc attaaaagta acagccatat ctgaacaaca gccttctact    840
acctggttgg ggtgataagt cattgcctct ttaatagaaa gcccaacaga tttggtatta    900
aatacatctt ttccatcagc atcttctgca ttttctgcaa atactccagc atatttcagg    960
caaactgcta gctgtttatc ttcagatatc ttccaaatca tccctccctg ttcaggacac   1020
ttttctggga tattgagaag gctgttaagt cttttcattg attctacact taagacaatt   1080
cctccttcca tacccacata ttcaaggtct ccagatttta tagtgtggcc tagatagaaa   1140
ggctgtgatg gatcctttttt taacaaaaaa tactttaggt tttcaatgat agcaaacgta   1200
gtggggcgtg caaggaagaa ccagttgtat tggtctctat acttacaaat acgcctttga   1260
taagtataga gaccaataca actggttctt ccttgca                             1297
```

```
<210>  459
<211>  777
<212>  DNA
<213>  Homo sapiens
```

```
<400>  459
tttttttttt ttctgaagaa gcatttatta gcatgcaggg cccatgctag aggctcctta     60
tttccagggc aaggccagcg agacagagcc cattgctcag gacgcagccc agattgcaaa    120
gagaggacag cccatggtag cggaagaaat tctggcggag agcactgtac ttggggtcct    180
tctctcgcag ctggcggtag ggatcgggac cctggtggct gcctggtacc tccccaccca    240
ggcctcgctc cttctccacg gtttgcaggg cccacatggc agctgtggt cggggttcca    300
gccagcgggc gttgacagtg gccagcgtaa ggctcaggaa cagcaggtaa agctggctgg    360
cctcccagaa tgtgagctga gcccaagcat gctgtgaagc caagatgcag aggttgatga    420
aggcacagcc catggagatg tggaagtaga aggggaagag tttgctctgc actagtccga    480
aggtatgtcg gggaaggctt cggaaaagca ggaagcctga gacgaaggtc acccacattt    540
gcatgcccca ggcacctgac aagaccagta gatggaccat cttaatcagg cctcctaggt    600
tcccgccttc ctccatcttg cagtccgtta ggaaccggga cctcaatccg cagcacccgg    660
attccgagaa cagaggcgtc ggggccaaat gggctgaatc tggtacctca ctcccacgcc    720
cccgggtgga cagcgaccct cctcggccgc gtcccctcgt gggtttcccc tcgtgcc      777
```

```
<210>  460
<211>  859
<212>  DNA
<213>  Homo sapiens
```

```
<400>  460
cctgtggaag aagagcagga tggagagcat ggtctggtcg atgttgcggt tgcagatgcc     60
ctcgttgatc aggtagcagg ggtcccgcag caccggctct agcgaatcct gccgcattat    120
gctgttgagc ttgtcggtat tgaggttctc aaagaccagc ttttcctgca gctgccgaaa    180
```

```
gttgctcact gtagggctgc ccgggttgtt gttctccccg ctgctgcctc gctggagccc    240
actccgatgg gccaggtcca ggcagcagtt gcagcagtcg aggccgacag gtgagcggca    300
atcgagcttg gactgggcca tcttctcagg ctcggaggtc gcctggcctg cgaggtcagg    360
ggcggctggc aggtgcgcgc ccaccgagct ggcctgaggg gactccaggg tgcctggaaa    420
agacaagctg tgaggaaaag agttggaaat tagcgcctaa agccagccac cttcggctcg    480
gccccttct ggctgtactg ctccgggtgc gaatagaaac agctggacaa acagctccga     540
gcggatcctt cgggctcact tcctcctctt cctccttctc ctcccctcc tcttgaggcc      600
ggggccgcc cccctgaggt gccacgcgcg ccccagcgc agtcccaagt ttcccaagtg        660
tgagcgggga ttggggcgga cctgtggagg caggaagggc gggcagcagg gcagagggag      720
agccagggcg cgcccttgct ccctccctcc tttgctccct ccctccccgg tttgcaggct      780
ctcaggctct cgggctcccc tgggctgtga cggctgagcg gtggcaggag ctgagagcga      840
gtgagctacg aaatcgtcg                                                   859
```

<210> 461
<211> 1975
<212> DNA
<213> Homo sapiens

<400> 461

```
agaaatcagc tttcttcaca gaagtcagtg ccgtgggtac ccattttaaa atccctgcca    60
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ttattgccta cttatatgaa ggagatccta aggttcaatg ttcaagagaa tgggtttta    180
tcttcattgc cttatttagg ctcttggtta tgtatgatcc tgtctggtca agctgctgac    240
aatttaaggg caaaatggaa tttttcaact ttatgtgttc gcagaatttt tagccttata   300
ggaatgattg gacctgcagt attcctggta gctgctggct tcattggctg tgattattct   360
ttggccgttg ctttcctaac tatatcaaca acactgggag gcttttgctc ttctggattt   420
agcatcaacc atctggatat tgctccttcg tatgctggta tcctcctggg catcacaaat   480
acatttgcca ctattccagg aatggttggg cccgtcattg ctaaaagtct gacccctgat   540
atggggatct cgctccatcg cccaggctgg agtgcagtgg cgtgatcttg gttcactgca    600
acttccatct cccaggttca agtgattctc ctacctcagc ctcctgagta tctgggatta   660
caggcgcccg tcaccacgcc cagctaattt tttgtatttt tagtagagat ggggtttcac   720
catgctggcc aggctggtct cgaactcctg atctcatgat tcgcccacct cagcccccca   780
aagtgctggg attacaggca tgagccaccg tgcccggccg cttcgcattt ttcttttgca    840
ggttgcatgc cagccaatat tcctctgtgc tgggaaggga aagtttgagg atgtatcaag   900
accatagcag tggatctcac tgctcttgcc tactcagggc tttatctaca cattgatagc    960
ccctcagagg aaaggcacca gccgaagagt cgacactggc tctgggcttg gatgctgcct   1020
ctgataaacg ctgggcactc tgaccctgaa gccagggagg gagtgcttgg cagctgcctg  1080
ggcacactcc cctcagtcca gttgccaggc gaaattatac agtggatggc agctccacag  1140
agatgctaaa gtttgaggtc taagtgtcag agagagctga caatttttat gaggaaagtg  1200
aacaacaaca ggtgtttatc agtacctgag aattatcatc tagtttaatt aagcaaaggt   1260
atcaggaggt ctgtttcagc tcattccctt tagtatggcc ctaaaaaatc aacagaactg   1320
tcctacttca tgttgcccga ctagcaggca ggtatgtgaa cctaaagtag aagtcctagc   1380
ttacatatta ttcataatta aacacagttc attttattat tctggcaact agtgatattt   1440
catgattata ggccttaaaa atctaataca agtacaatta aaaaaagaca tagaatgctt   1500
acacaataca gaaggcactt tgaggttaca tgataaataa aaatacatta atagaggcag   1560
gattatttat tggttccttc agtgtctgtg tccatggtga tcattgagag cccagttttg   1620
tacttcacct ttggcgaaat agtgttaaag aaaatggcac caaaaacatt aatagcagca   1680
gcaatataga acacggtttg ccattctcca acagtgttat caggggtcag acttttagca  1740
atgacgggcc caaccattcc tggaatagtg gcaaatgtat ttgtgatgcc caggaggata   1800
ccagcatacg aaggagcaat atccagatgg ttgatgctaa atccagaaga gcaaaagcct   1860
cccagtgttg ttgatatagt taggaaagca acggcaaag aataatcaca gccaatgaag    1920
ccagcagcta ccaggaatac tgcaggtcca atcattccta taaggctaaa aattc          1975
```

```
<210> 462
<211> 716
<212> DNA
<213> Homo sapiens
```

```
<400> 462
actgatagcc ctcgaaaccg ttgaggaccc tccgggacga cccacgcgtc cgcacacagt    60
gggcatccag gatctccccg aggtagcctg agccgccacc ccagctccca gctggcaggt   120
cctggggtgg aggggggtga aggcacccag aaacctcggg actacatcat ccttgccatc   180
ctgtcctgct tctgccccat gtggcctgtc aacatcgtgg ccttcgctta tgctgtcatg   240
tcccggaaca gcctgcagca gggggacgtg gacggggccc agcgtctggg ccgggtagcc   300
aagctcttaa gcatcgtggc gctggtgggg ggagtcctca tcatcatcgc ctcctgcgtc   360
atcaacttag gcgtgtataa gtgaggggct ctgccccgca tcccaagact tttcttcctg   420
ttgggagctg ccttgggccc attccctccc ctgggggag cccaactgat ggccctggcc   480
ccacccctaa ggaccaaggg agcctgagcg gccttgttta cagcttctgt cctgctcctg   540
catctttgcc agggtccttt tgccaactgt aagggccttg cctcattccc tggcaatggt   600
tccaacctcc ctgcactaat gcctgcatcc cctccggcct cttggccccc tatccctgca   660
cttctgggaa acctccctgg cactctggga aacctccctg gaacaacttc ccaaat       716
```

```
<210> 463
<211> 595
<212> DNA
<213> Homo sapiens
```

```
<400> 463
ctttttttct tttttttata aaacatgtca catcttgatg cagttgatgt caagtgtgct    60
taagtcatta tgaatcaaga gactaacaat agtggctgca gaaacaggtt tgttgtctgt   120
acaaagactt caggtaaatt atagtacttc catgttagct gtgcatgtcc accacgcttt   180
gtctgtaact cgagtagaaa aagatgttgt gttttaatta atcattcctt acaattcaag   240
atgaactcca catatttaag aattcttggc tgaaagaaaa gtcttcaaga tactggatgc   300
ctctcaccac tttgacaata aacacacaag aaaaccattg tgtaaggcac tcaaaaggtt   360
cttatcaatc acgagagatc agtcacactg acattcattc ccatgccagg actcacgtaa   420
gggacagcat gcactgcttt gggaaattct ggagtcataa cacgtccatt ttctccagta   480
cttcctgtaa ttgacagcct tgccttgttc ctcatggcat cattcaaggt catcttaaat   540
gagagaggag ggaaagaaag aaaaagagat catacgttat ggttttcaaa tgcat        595
```

```
<210> 464
<211> 2017
<212> DNA
<213> Homo sapiens
```

```
<400> 464
tttttttttt ttccttttaa aaactttatt taaatggaga ctcttagtca aatgattgga    60
```

```
aaaccaataa cgaaaaatag ttcttcaggt tcttctcctg gaaaggcgga ggacacacca      120
aactgcactg gccctgtcag gggacacggc accctcgtgg gaccaggctc agccctcggg      180
gtggcacgag gtcctgcagg ctgcaggacc ctcacactcc agccccgtct ggtgacccaa      240
cccgggcccg tggtgcatgc tggggaaggc cactggccgg cccctgggct tcggctcctg      300
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ggcaccagga ccgacgcaga gctggggtcc tgtccctaag cctgtggcac agcgactctt      420
gacatgggag ccagggagct gggaccgccg cacccctccc ctgcctccct cctggggtca      480
ccaccctcag gcggctgcca gctggcctag gacgcggcgg aactgctggg tgctgtggcc      540
cagctccttg accctctcca ccatgtcctg ggccgcggaa ggcgatgggt actgcaaggc      600
agcggccttg gtggtggcca cgatgccgcg caggaggtcg cacagcaggt tgctgtagtg      660
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ccgtgacacc tcctgttcca gtcgttcaaa ctgcttcagc tgctgcaact ccagctggct     1020
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ctccttcccc tgtaggtgga cgtagtcata gtcctccatc cagcccccct cgctgttctc     1140
gtactgccca tctggcgagt cctgggaggt gaacttaggg ggtgagggca ggggtcgtga     1200
ctggatgctg ctggtcttgt cagtgggggtt ggggtgcagg gtgccacccc cctcaggccc     1260
cggggcagtg gccttggtcc gtctgaagag cagtgaggca ttgccgtgca ggaaggaggc     1320
cagctgcttg gcgtcctcgg gcacagcccg cgagcaggcc accagccggt ccaggtcctc     1380
aagggtggct ccagagcctc cccggccagc gtcgagggcc tgaccatgtg ccaccagcgt     1440
ctggtgcacg tcctccatct tctgcagctg ccggctaagc ttggcatgca gggcacggtc     1500
agatgtgtgg gcagcattgc ccaccgcgct gcgggcaaac tccaacagct cgtggacggc     1560
actctggacg gcggccacag cagcctgcag gtcctgcacc agcggctcct gtggctcaga     1620
ggggctacgc cagctcccag tcgcaccggc gctgcctgcc aggtccagaa ggtgggcaac     1680
ggtggcgctc acaccctgct gcagccgtgc cagggcctcc acagcaactt ccagctccag     1740
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gccggtgctg gaggccgaca ggcgcttgcc ctctgccggg gcttcacgtt cagctggggg     1860
aggcaccgca tacacaccac tgtcgaccac gccaccatca gccacctcag gaggaagcac     1920
ccgttcacgg ggcacatcgt acagggtgcc cgggccaggc cgccgcaagc cagggggcac     1980
gtcgtagagg tcaggagccg ggggcggcac gtcatcc                              2017
```

```
<210> 465
<211> 1575
<212> DNA
<213> Homo sapiens
```

```
<400> 465
ggatttcgtt tcctccggct gggagtggcc gctctaggca gcgttgaggt cgcgggggttg       60
aggggggttg tgaaaggaga gcggcctctc ctctatggtc acggggccgg ggcacgcttc      120
ccccactctg tcttgttact tccggtagcg aagcctctcc ctcttcctct gctcccgcgg      180
ggtctgtgct gagaataatg gcccggttgg cccgggacga gtggaatgat taatgatgtt      240
ttgcagcagt tttctacgtc tgaaattttt tatgtctctg gaacccagaa tttgctaaga      300
gatggaggaa cctcagaaaa gctatgtgaa cacaatggac cttgagagag atgaacctct      360
caaaagcacc ggccctcaga tttctgttag tgaattttct tgccactgct gctacgacat      420
cctggttaac cccaccacct tgaactgtgg gcacagcttc tgccgtcact gccttgcttt      480
atggtgggca tcttcaaaga aaacagaatg tccagaatgc agagaaaaat gggaaggttt      540
ccccaaagtc agtattctcc tcaggatgc cattgaaaag ttatttcctg atgccattag      600
actgagattt gaagacattc agcagaataa tgacatagtc caaagtcttg cagcctttca      660
gaaatatggg aatgatcaga ttcctttagc tcctaacaca ggccgagcga atcagcagat      720
gggagggggga ttcttttccg gtgtgctcac agctttaact ggagtggcag tggtcctgct      780
cgtctatcac tggagcagca gggaatctga acacgacctc ctggtccaca aggctgtggc      840
caaatggacg gcggaagaag ttgtcctctg gctggagcag ctgggcccctt gggcatctct      900
ttacagggaa aggtttttat ctgaacgagt aaatggaagg ttgctttaa ctttgacaga      960
```

```
ggaagaattt tccaagacgc cctataccat agaaaacagc agccacagga gagccatcct   1020
catggagcta gaacgtgtca aagcattagg cgtgaagccc cccagaatc tctgggaata   1080
taaggctgtg aacccaggca ggtccctgtt cctgctatac gccctcaaga gctcccccag   1140
gctgagtctg ctctacctgt acctgtttga ctacaccgac accttcctac ctttcatcca   1200
caccatctgc cctctgcaag aagacagctc tggggaggac atcgtcacca agcttctgga   1260
tcttaaggag cctacgtgga agcagtggag agagttcctg gtcaaatact ccttccttcc   1320
ataccagctg attgctgagt ttgcttggga ctggttggag gtccattact ggacatcacg   1380
gtttctcatc atcaatgcta tgttactctc agttctggaa ttattctcct tttggagaat   1440
ctggtcgaga agtgaactga agtaagtatg ttttaatggt tgtcacaaca ggggatggga   1500
aagaaatacc aagtgagaga aagatcctct tttatttctc acacttgaaa taaatcctcc   1560
atccacccag aaaaa                                                   1575
```

```
        <210> 466
        <211> 493
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 466
agaaaaggct aggatgatat atgaagatta catttctata ctatcaccaa aagaggtcag    60
tcttgattct cgagttagag aggtgatcaa tagaaatctg ttggatccca atcctcacat   120
gtatgaagat gcccaacttc agatatatac tttaatgcac agagattctt ttccaaggtt   180
tttgaactct caaatttata agtcatttgt tgaaagtact gctggctctt cttctgaatc   240
ttaatgttca tttaaaaaca atcattttgg agggctgaga tgggaaataa aagtagttaa   300
ataacatcag aaactgagtt cctggagaac tacagtttag cattcctcag gctactgtga   360
aaacacaacc gttatggtct ttgtctccat ttttatcaag gtttttccatg gttaagtttg   420
gagaaaatac cacacaaaac aatgaattgc caaattgttt gttttattca agactcaatc   480
tactttgcaa gcg                                                      493
```

```
        <210> 467
        <211> 1572
        <212> DNA
        <213> Homo sapiens
```

```
        <400> 467
cttgtactac agtcaagatg aggagtccaa aataatgatc agtgactttg gattgtcaaa    60
aatggagggc aaaggagatg tgatgtccac tgcctgtgga actccaggct atgtcgctcc   120
tgaagtcctc gcccagaaac cttacagcaa agccgttgac tgctggtcca tcggagtgat   180
tgcctacatc ttgctctgcg gctaccctcc tttttatgat gaaaatgact ccaagctctt   240
tgagcagatc ctcaaggcgg aatatgagtt tgactctccc tactgggatg acatctccga   300
ctctgcaaaa gacttcattc ggaacctgat ggagaaggac ccgaataaaa gatacacgtg   360
tgagcaggca gctcggcacc catggatcgc tggtgacaca gccctcaaca aaaacatcca   420
cgagtccgtc agcgcccaga tccggaaaaa ctttgccaag agcaaatgga gacaagcatt   480
taatgccacg gccgtcgtca gacatatgag aaaactacac ctcggcagca gcctggacag   540
ttcaaatgca agtgtttcga gcagcctcag tttggccagc caaaaagact gtgcgtctgg   600
caccttccac gctctgtagt ttcatttctt cttcgtcggg ggtctcagga gttggagccg   660
agcggagacc caggcccacc actgtgacgg cagtgcactc tggaagcaag tgactggccc   720
tggaggtggg gcccgggggtc ggggctgggg aaggggagcc ccagggtcgc cagagccgcg   780
agccactcca gcgagacccc accttgcatg gtgccccttc ctgcatagga ctggaagacc   840
```

```
gaagtttttt tatggccata ttttctactg caattctgaa gtgttcattt ctcacaaact   900
gtactgactc gaggggcgct gatttcatag gatctggtgc tgtatatacg aatcttgcaa   960
agctctaact gaacggacct tcttattcct ctcccctaac accatcgttt ccactcttct  1020
cagtgtaggt aaccgtctat ggtgtgtttt ttcattaatg acaaaaaaaa aagggtttca  1080
actggattat ttaaatattg gtaaatattg tgcattaggg tttgtttttc cttttaagaa  1140
gtatgtcctt tgtatctcta agttacatga cctatatctt ttcctcttta atagtagttt  1200
tatgttaacc tttaagagat ttgtttttcc tcaaaggaga atttaaaggt attttttttaa  1260
aattctaata agaggatcag ccgggtgcaa tgactcatgc ctgtaatccc agcacgttgg  1320
gaggccaagt cgggcggatc acaaggtcag gagatcaagg ccatcctggt tctatactgt  1380
gtagattgct ggctactaaa aatacaaaaa attagccggg cgtggtggca cacacctagt  1440
agtcccggct actcgggtag gctgaggcag gagaattgct tgaacccggg agacggaggt  1500
tgcagtgagc tgagatcgtg ccactgcact ccagcctggg tgacagagca agactctgtc  1560
tcaaaaaaaa aa                                                      1572
```

```
<210> 468
<211> 1927
<212> DNA
<213> Homo sapiens
```

```
<400> 468
cggacgcgtg ggggagctgt gagtttcgag gatttcatca aaggtctttc cattttgctc    60
cgggggacag tacaagaaaa actcaattgg gcatttaatc tgtatgacat aaataaagat   120
ggctacatca ctaaagagga aatgcttgat ataatgaaag caatatacga tatgatgggt   180
aaatgtacat atcctgtcct caaagaagat gctcccagac aacacgttga aacatttttt   240
cagaaaatgg acaaaaataa agatgggggtt gttaccatag atgagttcat tgaaagctgc   300
caaaaagatg aaaacataat gcgctccatg cagctctttg aaaatgtgat ttaacttgtc   360
aaatagatcc tgaatccaac agacaaatgt gaactattct accacccttta aagttggagc   420
taccactttt agcatagatt gctcagcttg acactgaagc atattatgca aacaagcttt   480
gttttaatat aaagcaatcc ccaaaagatt tgagcttttca gttataaatt tgcatccttt   540
tcataatgcc actgagttca ggggatggtc taactcattt catactctgt gaatattcaa   600
aagtaataga atctggcata tagttttatt ggttccttag ccatgggatt attgaggctt   660
tcacatatca gtgattttaa aatatcagtg ttttttgcta ctcatttgta tgtattcagt   720
cctaggattt tgaatggttt tctaatatag tgacatctgc atttaatttc cagaaattaa   780
attaatttttc atgtttgaat gctgtaattc catttaaatt ccatttatat actttaagga   840
aacaagatta caacaattaa aaaaacacat agttccagtt tctatggcct tcccaccttc   900
tgttagaaat tagttttatc tggcattttt aaacatttaa aaattattaa acatttaaaa   960
attagtttat tatcagatat cagcatatgc ctaataaaac ttattttaat aagcatttaa  1020
ttttccataa tatgttacag ccaaggccta tataataatt ttggatttgt tcaatctttc  1080
ttacaggctg ttttctattg tatcaatcat tagtatcaat cattaagtgg aagttgaaga  1140
aggcatcaaa caaaacaagg atgtttacag acatatgcaa agggtcagga tatctatcct  1200
ccagtatata gtaatgctta ataacaagta atcctaacag cattaaaggc caaatctgtc  1260
ctctttcccc tgacttcctt acagcatgtt tatttatatt acaagccatt cagggacaaa  1320
gaaagaaacc ttgactaccc cactgtctac taagaacaaa cagcaagcaa aattagcaag  1380
caaaattcac tttgaaagca ccagtggttc cattacattg acaactacta ccaagattta  1440
gtagaaaata agtgctcaac aactaatcca gattacagta tgatttagct catcataatt  1500
cagattattt ttaatcatct tagccaaaac tgtaaagttg ccacattact aaagccacac  1560
acatcgtccc tgtttttgtag aaatatcaca aagaccaaga ggctacagaa ggaggaaatt  1620
tgcaactgtc tttgcaacaa taaatcaggt atctattctg gtgtagagat aggatgttga  1680
aagctgccct gctatcacca gtgtagaaat taagagtagt acaatacatg tacactgaaa  1740
tttgccatca cgtgtttgtg taaactcaat gtgcacattt tgtatttcaa aaagaaaaaa  1800
taaaagcaaa ataaaatgtt aaaaaaaaaa aaaggggcg gccgtttttaa aggatccagt  1860
tttacgaccg cgggctggca aggaaaaatt tttttatgg ggccccctaa attcaattcc  1920
cgggccg                                                           1927
```

```
<210> 469
<211> 1013
<212> DNA
<213> Homo sapiens
```

```
    <400> 469
cccctaggag  ccctgaacac  catacgccag  cttggcacga  ggggagaagt  ctcggtccta     60
taatggccag  catggcagac  agaaacatga  agttgttctc  ggggagggtg  gtgccagccc    120
aaggggaaga  aacctttgaa  aactggctga  cccaagtcaa  tggcgtcctg  ccagattgga    180
atatgtctga  ggaggaaaag  ctcaagcgct  tgatgaaaac  ccttaggggc  cctgcccgcg    240
aggtcatgcg  tgtgcttcag  gcgaccaacc  ctaacctaag  tgtggcagat  ttcttgcgag    300
ccatgaaatt  ggtgtttggg  gagtctgaaa  gcagtgtgac  tgcccatggt  aaattttta     360
acaccctaca  agctcaaggg  gagaaagcct  cccttatgt   gatccgttta  gaggtgcagc    420
tccagaacgc  tattcaggca  ggcattatag  ctgagaaaga  tgcaaaccgg  actcgcttgc    480
agcagctcct  tttaggcggt  gagctgagta  gggacctccg  actcagactt  aaggattttc    540
tcaggatgta  tgcaaatgag  caggagcggc  ttcccaactt  tctggagtta  atcaaaatgg    600
taagggagga  agaggattgg  gatgatgctt  ttattaaacg  gaagcgtcca  aaaaggtctg    660
agtcaatggt  ggagagggca  gtcagccctg  tggcatttca  gggctcccca  ccgatagtga    720
tcggcagtgc  tgactgcaat  gtgatagaga  tagatgatac  cctcgacgac  tccgatgagg    780
atgtgatcct  ggtggagtct  caggaccctc  cacttccatc  ctggggtgcc  cctcccctca    840
gagacagggc  cagacctcag  gatgaagtgc  tggtcattga  ttccccccac  aattccaggg    900
ctcagtttcc  ttccaccagt  ggtggttctg  gctataagaa  taacggtcct  ggggagatgc    960
gtagagccag  gaagcgaaaa  cacacaatcc  gctgttcgta  ttgtggtgag  gag          1013
```

```
<210> 470
<211> 1543
<212> DNA
<213> Homo sapiens
```

```
    <400> 470
tttttttttt  ttaactttaa  aactgccgtc  ttctgcttta  ttgacaggta  aattgttcaa     60
aaatgttctc  acaattcaat  aattaattac  aaagactgag  acttacatta  aaaaagtaaa    120
aaccagaacc  ccccaggtgc  ccatccagca  gaaggcccag  gagggcagtg  gggtggcagg    180
gctaggcggt  gctgggccac  tcagtgccga  cttgggggaag  tgcacgtcct  gaacagcctt    240
gccaagcagc  cgaccggtgg  gaggacaggg  gaagcctggc  ccaagctgtg  gacaagctgt    300
gtctgccgcc  acagttaatc  acaagcctct  gacgacacag  ggccacagag  ctggtcactc    360
aacatctggt  acaaagggtg  aggtgaaatc  cacgcgcagg  ggattgctgt  gccgtgggcc    420
ggggccagtg  tgcaggagtg  tgttgggtgg  gtctacgtga  tcatacgggc  tactaatcac    480
gggggctccc  atgcggggggc  aggactggtg  ggggggggggg  cgggccaggg  cggggcgggg    540
tggggtatcc  cagtggctgc  ttcgtgggcg  ccctggggct  ctgacttccc  tcagcccagc    600
aggccacagg  ggctgcctgc  accacgacac  tcgctggttt  tatggcagga  ggcagaagcc    660
gtggaagcga  atggaaaaca  gcacagctga  cttcacagta  gtagatactg  gtgacacttc    720
atggctgcga  cccagaatga  acttaacgca  cacagggacg  cagggtgtca  ctggtcctgg    780
gcctttgtcc  atgactaggt  ggtcagcagg  acttctgcag  ctgactgtgc  aatggctaaa    840
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gaatgctata  ggacctccta  ctattctctt  aaggtcctag  gaaagtttca  ggaactaggg    960
aaaagactgg  gtactgaggc  tgtgtcccca  gatgtctgct  tccgaagcag  ccgcgtcatg   1020
acgggtttct  gctgaggaag  tggtgttggc  agggccccat  atgccctctc  gggttgtcag   1080
gggtggggaga  caggctgtat  ggggggtcctt  catgtgcaga  tggaacagca  tcgcctcaca   1140
gctgtgcaga  cgaacagatg  tggtctactg  ccacgaacaa  tgcggcataa  aactgatcaa   1200
```

```
tattataata aagatttgtc ttcttcatct cccatatcta caaagtgatt ctacatttcc    1260
ttggacaaca ctggagggcc cgctcagtct tggcactgac gctggaggcc atctccagct    1320
ccctggcccc tgtggcgagc tggcggcttc aggtgtcaca ggccggctgc tccaggcctt    1380
cgagggggag ctggctcctg tggggggagt tggggctcgg tgggccgctg gggttggagc    1440
tattcgatgg agttgagtgt ttggtggagt ccgaatcagg ctctttgtca aagtcctggt    1500
ctggatcaga catacttctc agaggcacag tgcacgctac gct                      1543
```

```
<210> 471
<211> 1154
<212> DNA
<213> Homo sapiens
```

```
<400> 471
actacagtgc ggtggaattc gctgagcgag gcagcggcgg cagcagcggg gacgagctca      60
gggaggacga tgagcccgtc aagaagcggg gacgcaaggg ccggggccgg ggtcccccgt     120
cctcctctga ctccgagccc gaggccgagc tggagagaga ggccaagaaa tcagcgaaga     180
agccgcagtc ctcaagcaca gagcccgcca ggaaacctgg ccagaaggag aagagagtgc     240
ggcccgagga gaagcaacaa gccaagcccg tgaaggtgga gcggacccgg aagcggtccg     300
agggcttctc gatggacagg aaggtagaga agaagaaaga gccctccgtg gaggagaagc     360
tgcagaagct gcacagtgag atcaagtttg ccctaaaggt cgacagcccg gacgtgaaga     420
ggtgcctgaa tgccctagag gagctgggaa ccctgcaggt gacctctcag atcctccaga     480
agaacacaga cgtggtggcc accttgaaga agattcgccg ttacaaagcg aacaaggacg      540
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tcgaggcggt gcagaaagtg aacaaggctg ggatggagaa ggagaaggcc gaggagaagc     660
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tttttcctgc ctaatttctg tgatttccaa ccaacatgaa atgactataa acggtttttt    1140
aatgaaaaaa aaaa                                                       1154
```

```
<210> 472
<211> 5202
<212> DNA
<213> Homo sapiens
```

```
<400> 472
atccaagggt tgtatcgagc ctataaaagc acagttttaa gagagattcc cttttctttt      60
ggtccagttt cccttatggg agtccttaaa agcccttggg tcctggaggc agtatcatgt     120
ggtggattct tggcagtcag cagtctgtgc agcttttgca ggtggatctg ccgctgcagt     180
caccaccct ctagacgtgg caaagacaag aattacgctg caaaggctg tgctccagca      240
actgctgatg ggaatgtgct ctctgtcctg catggggtct tgccgttcca aggggctggc     300
agggattatt gccaggtgtc cttcccctcc gaaatggcca gcccatcaag tctggggagg     360
tttccatctt tctggggggcc ttatgacccg aaacgcacag cttgctgttg gaagttggca     420
gaaagagtcc cttgaagcag agacaagcct cacctccact tctgtcaaga gaggggcctg     480
```

```
cagtgcaaac cctcttccgc tgagcagctg tctgaactat aggccccagt gctgaagacc  540
agttgtgcta agataccggc atggagattg tgccatccgt ggtataggct ggctggtatg  600
aagtcattgg cctgtatgcc agagagctaa gagaagaaaa cggggtctgt ggcggtactc  660
tgaacaattt cctcagaacc tcttaataaa taagtttggt aatgctgagg ccaggccttt  720
tagagctttc atttgatctg tatctgatct ttcatttcct gacacctgat ggtggattca  780
gcagaaggca agatggttat aattctaaaa gaatagcttg tttgtttgtt tgtttgggga  840
aaaggagact tggggaagag ttgtgtatgt gggtgtttct ccccctagtt aattcctgtt  900
gtgtaagggt aggctttgtt gaaaaagaaa gaaagattga actacaggtg catagcaagc  960
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cagctgcaac tcaagtgact aggtgggccc agctggcttc gtgcaggagg cacggtggg. 1140
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tactccctct ttcacattgc ctctcagaag cagcaaattc acatattttg tggaagtaag 1620
attagtcagt taactgtcaa gaacaaaatt ctaaatgtgc ttaccttttg aacagtgatg 1680
acacctgaca gtaattgtta actattttct cagtaactcc cttcagcttt tggccaaagg 1740
aacatttgaa ggaccttgtt tctatttaag ttttactaaa tgacacattg gcactcataa 1800
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cctttccagt cccagctcag tttcatctgt gcgaaggaat ggcatggaca ggcctgctct 1920
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acagattcta cgccttacag acagacagga cttaaaccta aaaggaaaag ccattcactg 2280
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244

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<210> 473
<211> 4715
<212> DNA
<213> Homo sapiens

<400> 473

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245

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        <211> 1374
        <212> DNA
        <213> Homo sapiens
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gctgcagaga ctatcattga tacgaagggt gtgactgctc tggtcagcga tgctatccac    180
aatgacttgc aagatgactc cctctacctt cctccctgct atgatgatgc agccaagcct    240
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<210> 475
<211> 3076
<212> DNA
<213> Homo sapiens

<400> 475

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        <211> 959
        <212> DNA
        <213> Homo sapiens
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```

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        <210> 477
        <211> 3652
        <212> DNA
        <213> Homo sapiens
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